This is a manuscript, but not a publication. It is not issued for permanent scientific records and is disclaimed for the purpose of zoological nomenclature in the sense of The Code of Zoological Nomenclature article 8.2 (ICZN, 1999; Russian translation, 2000).

5. Review of the subgenera, alphabetically ordered, unnamed groups of subgeneric level, and supplement

Genus: *Chrysolina* Motschulsky, 1860a

The present bibliography includes the original citations of the generic names as well as the subgeneric names originally included in the other genera, which have been included in the genus *Chrysolina* later. The names are arranged chronologically, and within one year – alphabetically. The names of the subgenera originally described in the genus *Chrysolina* are not included in this list.

Chrysomela Linnaeus, 1758: 368 (type species Chrysomela populi Linnaeus, 1758: 370, designated by Latreille, 1810), partim.

Atechna Chevrolat in: Dejean, 1833: 403 (type species Chrysomela striata Degeer, 1778: 105, designated by Monrós, Bechyné, 1956).

Polysticta Hope, 1840: 164 (type species Chrysomela guttata Fabricius, 1792: 313, by the original designation).

Eleia Gistel, 1848: VIII, substitute name for Chrysomela Linnaeus, 1758: 368.

Anopachys Motschulsky, 1860a: 202 (type species Chrysomela asclepiadis A.Villa et J.B. Villa, 1833: 36, by the original designation).

Apterosoma Motschulsky, 1860b: 23 (type species Apterosoma angusticollis Motschulsky, 1860b: 23, by the monotypy).

Bittotaenia Motschulsky, 1860a: 206 (type species Chrysomela salviae C.R. Sahlberg, 1823: 76, by the original designation).

Centoptera Motschulsky, 1860a: 207 (type species Chrysomela regalis Olivier, 1807: 538, by the original designation).

Chalcoidea Motschulsky, 1860a: 209 (type species Chrysomela marginata Linnaeus, 1758: 371, by the original designation).

Chrysolina Motschulsky, 1860a: 210 (type species Chrysomela staphylaea Linnaeus, 1758: 370, by the original designation).

Chrysomela: Motschulsky, 1860a: 204 (type species Chrysomela graminis Linnaeus, 1758: 369, by the original designation).

Chrysomorpha Motschulsky, 1860a: 204 (type species Chrysomela cerealis Linnaeus, 1767: 588, by the original designation).

Colaphodes Motschulsky, 1860a: 212 (type species Chrysomela hottentotta Fabricius, 1792: 309, by the original designation).

Colaphoptera Motschulsky, 1860a: 215 (type species Chrysomela hemisphaerica Germar, 1817: 204, by the original designation).

Colaphosoma Motschulsky, 1860a: 216 (type species Chrysomela goettingensis Linnaeus, 1761: 506, by the original designation).

Craspeda Motschulsky, 1860a: 191 (type species Chrysomela besseri Krynicki, 1832: 171, by the original designation).

Heliostola Motschulsky, 1860a: 190 (type species Chrysomela islandica Germar, 1824: 585, by the original designation).

Hoplosoma Motschulsky, 1860a: 211 (type species Chrysomela lamina Fabricius, 1792: 311, by the original designation).

Lithoptera Motschulsky, 1860a: 210 (type species Chrysomela musiva Gebler, 1830: 215, by the original designation).

Ovomorpha Motschulsky, 1860a: 213 (type species Chrysomela rossii Suffrian, 1851: 38, by the original designation).

Ovosoma Motschulsky, 1860a: 214 (type species Chrysomela vernalis Brullé, 1836: 269, by the original designation).

Ovostoma Motschulsky, 1860a: 215 (type species Chrysomela coerulea Olivier, 1807: 515, by the original designation).

Pleurosticha Motschulsky, 1860a: 191 (type species Chrysomela sylvatica Gebler, 1823: 118, by the monotypy).

Stichoptera Motschulsky, 1860a: 209 (type species Chrysomela sanguinolenta Linnaeus, 1758: 371, by the original designation).

Stichosoma Motschulsky, 1860a: 208 (type species Chrysomela banksi Fabricius, 1775: 95, by the original designation).

Taeniosticha Motschulsky, 1860a: 207 (type species Chrysomela lurida Linnaeus, 1767: 590, by the original designation).

Threnosoma Motschulsky, 1860a: 213 (type species Chrysomela helopioides Suffrian, 1851: 12, by the original designation).

Timarchoptera Motschulsky, 1860a: 188 (type species Chrysomela haemochlora Gebler, 1823: 120, by the original designation).

Zeugotaenia Motschulsky, 1860a: 206 (type species Chrysomela limbata Fabricius, 1775: 101, by the original designation).

Crositops Marseul, 1883: 105 (type species Chrysomela pedestris Gebler, 1823: 118, by the monotypy).

Semenowia Weise, 1889a: 605 (type species Semenowia chalcea Weise, 1889a: 605, by the monotypy).

Pachygnatha Weise, 1892d: 352 (type species Orina dolens Kraatz, 1885: 298, by the monotypy).

Gnathomela Jacobson, 1895: 297, substitute name for Pachygnatha Weise, 1892d: 352, nec Sundevall, 1823 (Arachnida).

Timarchida Ganglbauer, 1897: 571 (type species Timarchida deubeli Ganglbauer, 1897: 572, by the monotypy).

Synerga Weise, 1900: 283 (type species Chrysomela bella Jacoby, 1890: 253, by the monotypy).

Crosita (Pezocrosita Jacobson, 1901a: 78) (type species Crosita kuznetzowi Jacobson, 1901a: 78, by the monotypy).

Cecchiniola Jacobson, 1908: 624 (type species Chrysomela platyscelidina Jacobson, 1898: 201, by the original designation).

Timarchomela Achard, 1922: 17 (type species Timarchomela aeneolucens Achard, 1922: 17, designated by Kippenberg, 2010: 69)

Lithopteroides Strand, 1935: 295, substitute name for Lithoptera Motschulsky, 1860a: 210 nec J. Müller, 1858: 154 (Protozoa).

Minckia Strand, 1935: 292, substitute name for Hoplosoma Motschulsky, 1860a: 211 nec Agassiz, 1846 (Pisces).

Dlochrysa: Bechyné, 1950a: 172 (type species Coccinella fastuosa Scopoli, 1763: 74, by the monotypy), nec Motschulsky, 1860a: 203.

Chrysochloa (Cobosorina David, 1953: 186) (type species Chrysochloa colasi Cobos, 1952: 5, by the monotypy).

Oreina: Monrós et Bechyné, 1956: 1129, partim.

Doeberlia Warchałowski, 2007: 481 (type species Doeberlia subopaca Warchałowski, 2007: 481, by the original designation).

Chalcoidea (Hypochalcoidea Bourdonné, 2012: 123) (type species Chrysomela rufilabris var. discriminata Jacobson, 1901b: 124, by the original designation).

Chalcoidea (Upseleatlasia Bourdonné, 2012: 121) (type species: Chrysomela furva Peyerimhoff in: Deville, Peyerimhoff, 1926: 96, by the original designation).

Subgenus *Allochrysolina* Bechyné, 1950a

Diagnosis

Dorsum black or dark metallic (blue, violet, or bronze), unicolorous, or pronotum and elytra slightly differently colored, in some specimens of *Ch. confossa* elytra rufous with black sutural stripe broadened at base.

Last maxillary palpomere elongate-oval, of same length and width as penultimate, similar in both sexes.

Pronotal lateral sides strongly convergent anteriorly, straight at entire length or rounded near anterior angles, sometimes lateral sides slightly concave near base. Pronotal lateral calli narrow, separated interiorly by very shallow lateral impression (sometimes obsolete or absent) becoming deeper near base. Lateral impression covered by large punctures which partly confluent near base. Pronotal disc very finely punctate and very distinctly reticulate, because of that it appears to be sericeous. Anterior border of pronotum marginated, ciliate. Anterior setiferous pore present.

Prothoracic hypomeron convex, with deep lateral impression covered by wrinkles. Basal fold strong.

Elytron with convex humeral callus; with fine to large (or foveiform) punctures arranged in paired regular rows, or mostly irregular.

Epipleura inclined outside and visible in lateral view along entire length.

Hind wings reaching elytral apex.

Tarsomeres 1–3 with entire sole in both sexes; in male tarsomeres 1–3 broader than in female. Claw tarsomere without denticles beneath.

Pygidium with more or less distinct impression along entire length.

Last abdominal sternite convex in both sexes.

Aedeagus round in cross-section, narrow, long, slightly curved; flagellum narrow, slightly projected beyond apical orifice.

Differential diagnosis

Allochrysolina differs from subgenera *Maenadochrysa* and *Colaphodes* in pronotal disc being sericeous, very finely punctate, and in elytra more or less parallel-sided near mid-length (only in *Ch.* (*Maenadochrysa) pseudoaenea* pronotum is sericeous-shining, but pronotal lateral sides convex, arc-shaped, pronotal disc usually more distinctly and largely punctate, and elytra rounded laterally). Besides that, *Allochrysolina* differs from *Maenadochrysa* in tarsi bearing entire sole in both sexes.

Ch. (*Allochrysolina) lepida* looks like *Ch.* (*Hypericia) didymata* because of elytral puncture rows distinct and regular, paired, and pronotal lateral impressions shallow, but differs in pronotal lateral sides straight along almost entire length, smaller number of large punctures covering pronotal lateral impression (about 30 punctures) and in elytral lateral sides parallel near mid-length.

Key to species and some subspecies

Ch. lepida is not divided into subspecies here. I do not have enough specimens to confirm the sub-specific difference between *Ch lepida lepida* and *Ch. lepida gastonis. Chrysolina fuliginosa subtilipunctata* is not included in the key, because I have not examined specimens of this subspecies.

1(2) Elytral puncture rows distinct among very fine punctures of intervals. Dorsum unicolorous coppery-bronze, or head and pronotum bronze-green, elytra blue; antennae and tarsi rufous, femora and tibiae brown with metallic reflection or rufous. Dorsum entirely moderately shining. Aedeagus – Fig. 1: 8. Length 5.5–8.0 mm. Fig. 2: 7. S Europe, N Africa.
Ch. lepida (Olivier, 1807)

2(1) Elytral puncture rows hardly visible because of rather large punctures of intervals, or elytral punctures mostly irregular (Figs. 1: 1, 2: 1). Antennae and legs black or brown, with metallic reflection. Dorsum moderately shining with pronotum sericeous, or entirely dull.

3(12) Elytral intervals between the main punctures are covered with numerous fine punctures.

4(7) Main elytral punctures moderate to fine, mostly irregular, intervals between them are mostly or entirely flat, covered by numerous very fine punctures. Dorsum blue, violet, green, blackish blue, blackish violet, or black; moderately shining with pronotum sericeous. Aedeagus – Figs. 1: 7; 3: 3. Length 7.5–10.0 mm. Species from Europe and Algeria.

5(6) Elytral rows consist of moderately large punctures, intervals flat, covered by moderately large, dense punctures, owing to which the rows are hardly visible. Pronotal disc with dense, very fine, but distinct punctures. Fig. 3: 3. N-E Spain, S France, Italy, Algeria.
Ch. fuliginosa fuliginosa (Olivier, 1807)

6(5) Dorsal coloration as in nominotypical subspecies. Elytral rows consist of more scattered and more coarse punctures, than in nominotypical subspecies, intervals densely minutely punctate and partly convex. Pronotal disc with hardly visible very fine punctures. Figs. 1: 7; 2: 6, 9, 10. C Europe.
Ch. fuliginosa galii (Weise, 1884a)

7(4) Main elytral punctures large. Dorsum moderately shining, with pronotum sericeous.

8(11) Elytral intervals convex, strongly wrinkled.

9(10) Dorsum black. Pronotal disc with dense, very fine, but distinct punctures. Length 7.7 mm. Spain and Portugal.
Ch. fuliginosa coriacea (Suffrian, 1851)

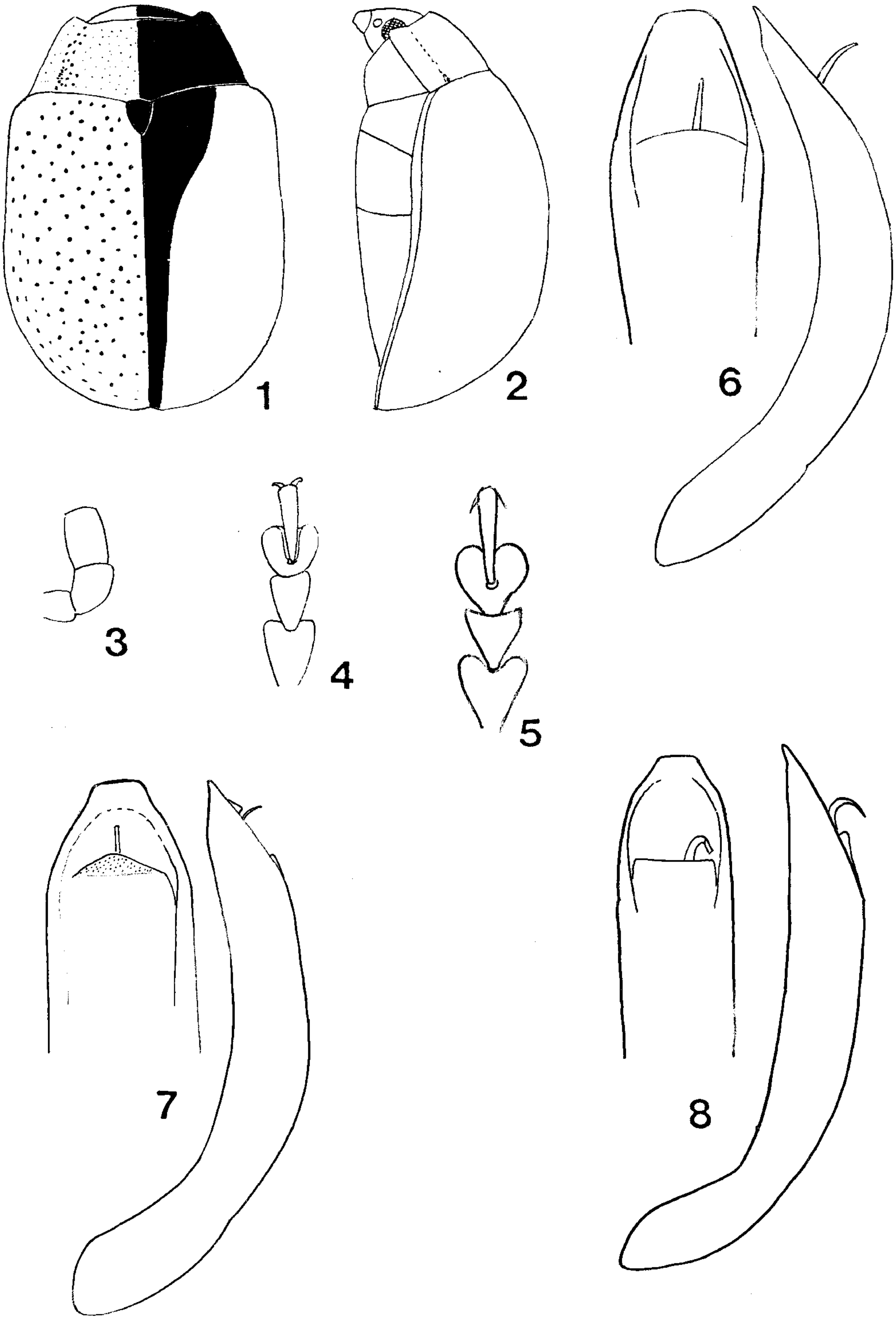
10(9) Dorsum bronze. Pronotal disc with dense, very fine punctures. Length 8.5–9.0 mm. Algeria.
Ch. ruginosa (Fairmaire, 1873)

11(8) Elytral intervals weakly convex, slightly wrinkled. Dorsum black. Pronotal disc with dense, very fine, but distinct punctures. Length 8.0 mm. Spain (Catalonia).
Ch. fuliginosa espanoli Bechyné, 1950a

12(3) Elytral intervals between the main punctures are covered by sparse fine punctures.

13(14) Dorsum moderately shining with pronotum sericeous. Elytra entirely black or rufous with black sutural stripe (Fig. 1: 1). Elytral intervals convex. Aedeagus – Fig. 1: 6. Length 8.0–9.0 mm. Figs. 1: 1–6; 2: 5, 8. Algeria and S Spain. *Ch. confossa* (Fairmaire, 1865)

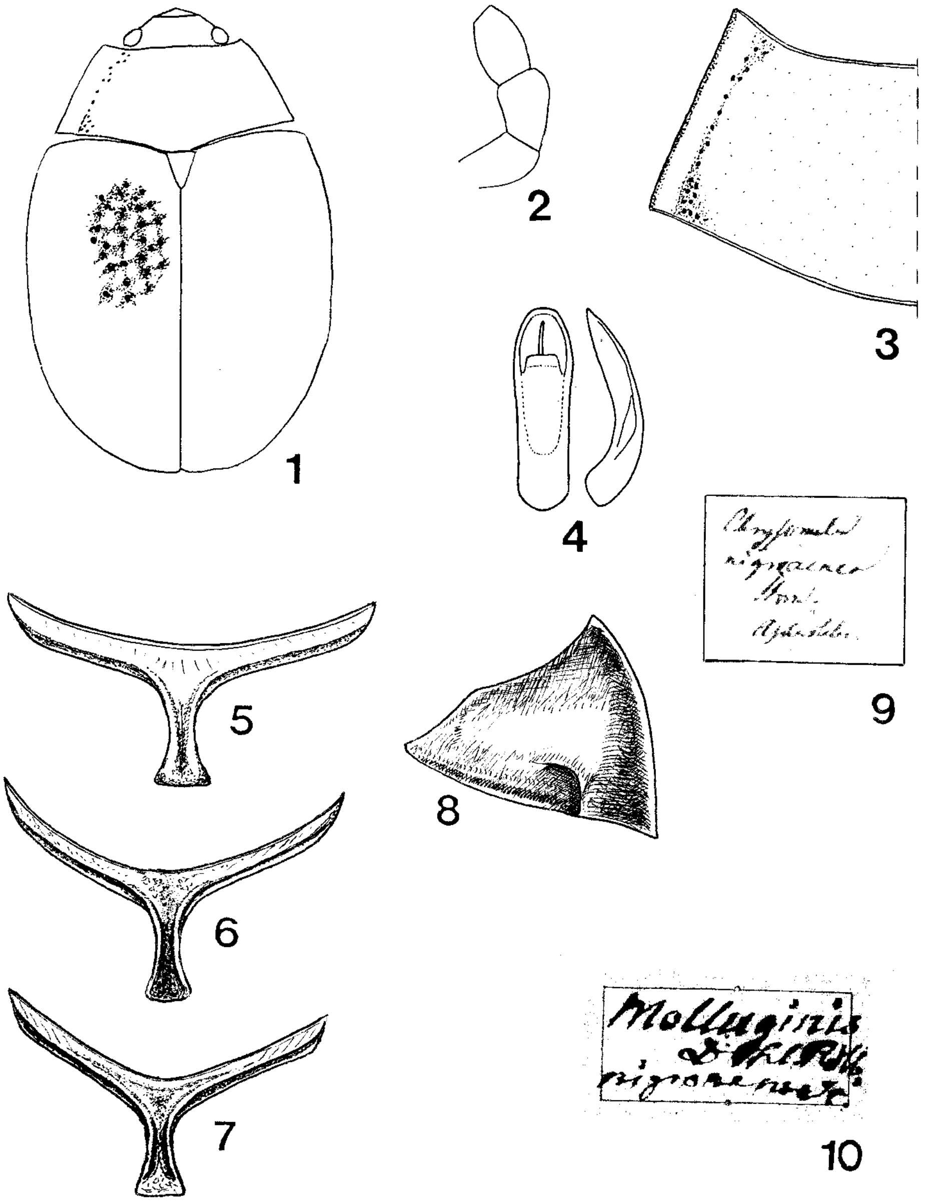
14(13) Dorsum entirely dull. Elytra entirely black. Elytral intervals with large wrinkles (Fig. 2: 1). Aedeagus – Figs. 2: 4;.3: 1, 2. Length 9.0 mm. Figs. 2: 1–4; 3: 1, 2. Morocco.
Ch. opacicollis (Fairmaire, 1865)



Allochrysolina **figure 1:** 1–4 – *Chrysolina confossa*, female (Algeria): 1 – dorsal view, 2 – lateral view, 3 – maxillary palpus, 4 – fore-tarsus; 5–6 – *Ch. confossa*, male (Algeria): 5– fore-tarsus, 6 – aedeagus, dorsal and lateral view;

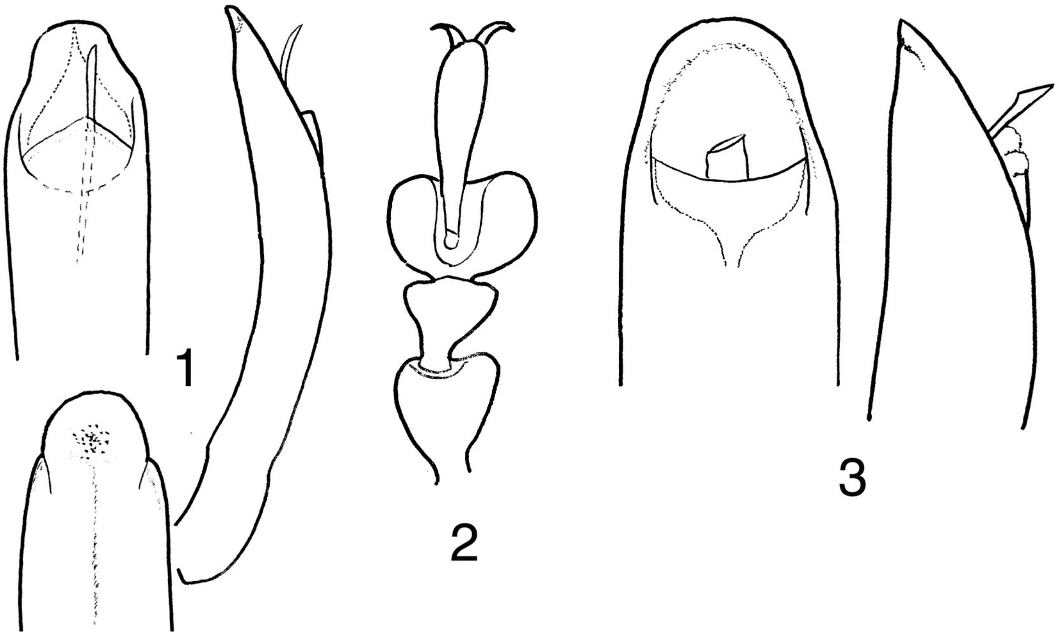
Allochrysolina

7 – *Ch. fuliginosa galii* (France), aedeagus, dorsal and lateral view; 8 – *Ch. lepida gastonis* (Algeria), aedeagus, dorsal and lateral view. (Orig.)



***Allochrysolina* figure 2:** 1–4 – *Chrysolina opacicollis*: 1–3 – female (Morocco: Ifrane): 1 – dorsal view, 2 – maxillary palpus, 3 – pronotum, dorsal view, 4 – male, lectotype (Morocco: Rif), aedeagus, dorsal and lateral view; 5–7 – prosternum: 5 – *Ch. confossa*, male, 6 – *Ch. fuliginosa galii*, female, 7 – *Ch. lepida lepida*, female; 8 – *Ch. confossa*, male, prothoracic hypomeron; 9–10 –

original labels of the syntype of *Chrysomela molluginis* Suffrian. (After: Bourdonné, Doguet, 1991: 4; others – orig.)



***Allochrysolina* figure 3:** 1–2 – *Chrysolina opacicollis*, male: 1 – aedeagus, dorsal, ventral, and lateral view, 3 – *Ch. fuliginosa fuliginosa*, male (syntype *Ch. fuliginosa microsticha*, Italy: San Remo), aedeagus, dorsal and lateral view. (Orig.)

Subgenus *Allohypericia* Bechyné, 1950a

Diagnosis

Dorsum black or dark metallic, unicolorous or elytra and pronotum differently colored, or with elytra apically or entirely brown, with metallic reflection (or without it).

Last maxillary palpomere hardly broader in male than in female, or similar in both sexes.

Pronotum swollen laterally along entire length. Lateral impression present along entire length, shallow to deep, covered by large punctures. Anterior side of pronotum marginated, ciliate, without anterior setiferous pores in most species, with pores in *Ch. koltzei*.

Prothoracic hypomeron with distinct (to strong) basal fold in the most species, with very weak fold in *Ch. mauroi* only.

Elytral punctures arranged in distinct or mostly confused rows, in the latter case, only 2 lateral and some of discal rows hardly visible among dense punctures in intervals.

Elytral epipleura inclined outside, visible along entire length in lateral view.

Hind wings developed, reduced, or absent.

In most species, male fore- and mid-tarsi dilated or narrow, more or less broader than in female, sole of tarsomere 1 of all tarsi entire or with glabrous stripe in basal ¼–¾; female: sole of tarsomere 1 of all tarsi with broad glabrous stripe along entire length, tarsomere 2 (or 2 and 3) of all tarsi with narrow glabrous stripe. In *Ch. koltzei* and *Ch. mauroi*, tarsomeres 1–3 entirely pubescent beneath in both sexes, slightly broader in male than in female. Claw tarsomere without denticles beneath.

Pygidium with groove along entire length (in most species), or in basal ½ only (in *Ch. koltzei* and *Ch. mauroi*).

Last abdominal sternite evenly convex in both sexes.

Aedeagus oval in cross-section, evenly curved viewed laterally, with almost parallel sides or broadened towards apical orifice viewed dorsally. Flagellum simple, exposed.

Differential diagnosis

I include in the subgenus *Allohypericia* the species differing from the allied subgenera *Pezocrosita* and *Chalcoidea* in the following main features: 1) pronotum with convex lateral calli along entire length, bounded interiorly at their whole length by impression or groove filled with large punctures, 2) aedeagus with trapeziform or rounded apex bearing 2 small calli or denticles ventrally. Meanwhile, the separation of the subgenera *Allohypericia* and *Pezocrosita* is of some difficulty because of the heterogeneity of the latter. Nevertheless, developed hind wings and above-mentioned shape of aedeagus apex are never occur in *Pezocrosita*.

Allohypericia members differ from unicolorous species of the subgenus *Chrysocrosita* in the elytral punctures arranged in rows, however, these rows are sometimes hardly visible because of large and dense punctures in intervals. *Ch.* (*Allohypericia*) *koltzei* looks like *Ch.* (*Erythrochrysa*) *polita* and differs in elytral puncturation double: large punctures arranged in paired rows visible on densely finely punctured background (elytral puncturation entirely irregular in *Ch. polita*).

Allohypericia differs from *Pierryvettia* in elytral epipleura inclined outside, visible along entire length in lateral view, and in the lateral impression of pronotum present along entire length.

Key to species and subspecies

1(20) Species from Asia.

2(3) Elytral punctures mostly irregular, very dense; only two lateral and 2–4 discal rows hardly visible (Fig. 1: 9). All tarsomeres 1–3 entirely pubescent beneath in both sexes. Anterior setiferous pore of pronotum present. Pygidium with groove in basal ½ only. Length 5.5–8.0 mm. *Ch. koltzei* (Weise, 1887a)

(a) subsp. *koltzei*. E Siberia, the Far East. Head and pronotum bronze, elytra reddish with bronze tinge. Aedeagus – fig. 1: 6. Some specimens from the Far East (Primorsky Krai) are entirely dark bronze dorsally and represent an intermediate form between the present subspecies and subspecies *lamii*.

(b) subsp. *brunneipennis* (Matsumura, 1911). Sakhalin Isl. Head and pronotum black with weak bronze or violet (sometimes bluish in part) tinge, elytra reddish, without metallic tinge.

(c) subsp. *lamii* Takizawa, 1970. Primorsky Krai, Kurile Isls., Hokkaido. Body entirely dark violet dorsally, head and pronotum or only pronotum with bluish reflection.

3(2) Elytra with distinct puncture rows. Anterior setiferous pore of pronotum absent.

4(19) In female, all tarsomeres 1 with glabrous stripe beneath, at least basally. Pygidium with groove along entire length.

5(16) Prothoracic hypomeron with vertical lateral border separating smooth marginal stripe along entire length (Fig. 1: 7).

6(7) Antennomere 10 1.1X longer than wide (Fig. 2: 3). Species from Wrangel Isl. and Chukot Penins. Dorsum dull, moderately or sericeous shining, green, with vertex laterally and pronotal calli violet; or head, pronotum, and epipleura violet, elytra green with lateral margins violet. Underside violet or black with violet tinge. Antennae black with antennomere 1 (or 1–2) rufous beneath. Legs black or blackish blue. Length: 5.8–5.9 mm (male), 6.6–7.0 mm (female). Aedeagus – fig. 2: 4.

Ch. arctica L.Medvedev in: Medvedev, Korotyaev, 1980

7(6) Antennomere 10 1.3–2.0 X longer than wide. Species from C Asia, S Siberia, S Far East, Mongolia, China, and Japan.

8(15) Aedeagus shorter, with apex narrower, bearing 2 small sharp calli. In female, all tarsomeres 1 ventrally with glabrous stripe along entire length (broad in *Ch. aeruginosa*, narrow in *Ch. peninsularis*).

9(10) Body usually larger (7.5–9.6 mm long). Pronotum broadest at mid-length, or just before mid-length, or just before base, or at base, with arc-shaped lateral sides (Fig. 4: 12). Humeral calli very weak or absent. Dorsum very shining, dark bronze. Ventral side and legs dark brown with strong bronze reflection. Antennae brown, antennomeres 1 and 2 rufous beneath. Aedeagus – fig. 2: 2, 5, 8. Male tarsi – fig. 2: 6, 7. Korea, E China, S Primorsky Krai.

Ch. peninsularis Bechyné, 1952a

10(9) Body usually smaller (4.6–8.3 mm long). Pronotum broadest basally, with lateral sides almost straight in basal ½ (Fig. 4: 13). Humeral calli convex.

11(12) Dorsum moderately shining, sericeous or dull, dark metallic or black, unicolorous or with elytra reddish apically.

Ch. aeruginosa (Faldermann, 1835)

(a) subsp. *aeruginosa*. E Kazakhstan, Siberia, Far East, Mongolia, (steppes), N, N-W China. Dorsum moderately shining, or sericeous shining, or dull, unicolorous, dark blue (with elytral apical ½ reddish in ab. *dimidiata*), black, or blackish bronze. Pronotal posterior corners rectangular. Elytral rows of more or less large dense punctures.; rows usually visible at apical slope, rarely invisible. Length 4.6–8.3 mm. Aedeagus – fig. 2: 1.

(b) subsp. *chingana* Bechyné, 1952a is unknown to me. China (Khingan). Dorsum black with bluish tinge or brightly bronze, in male fat shining; elytral punctures sparse; female elytra weakly broadened (after Bechyné, 1952a).

(c) subsp. *kabana Lopatin, 2009*. China (S Gansu). Dorsum black with weak golden tinge. Pronotal lateral impressions covered with broad stripe of large dense punctures. Elytra with regular rows of large deep punctures; rows distinct till apex. This subspecies is similar with subsp. *poricollis* and differs in body narrower, and elytral rows more regular. Length 6.0 mm. Aedeagus – fig. 4: 11.

(d) subsp. *muralis* (Csiki, 1901). N China. Dorsum moderately shining, black with violet reflection. Pronotal posterior corners slightly less than rectangular, lateral impressions wide and deep along entire length, covered by numerous large punctures. Elytra with rows of dense moderately large punctures; rows distinct till apex. Length: 6.1 mm (male).

(e) subsp. *poricollis* (Motschulsky, 1860a). N-E China. Dorsum moderately shining, bronzy-black. Pronotal posterior corners rectangular, lateral impressions wide and deep along entire length, covered by numerous large punctures. Elytra with regular and partially slightly undulate rows of moderately large punctures; rows distinct till apex. Length: 6.8–6.9 mm (male), 6.9–7.7 mm (female).

12(11) Dorsum shining, brightly colored, green, or partly dark blue, violet, or greenish coppery.

13(14) Pronotal posterior corners rectangular, elytral rows regular, distinct on apical slope, body length: 5.3–7.3 mm (male), 6.2–8.3 mm (female). Aedeagus – fig. 7: 4. E Siberia, S, W Mongolia, N China.
Ch.centralasiae (Lopatin, 1970a)

14(13) Pronotal posterior corners slightly less than rectangular, elytral rows confused and hardly visible on apical slope, body length: 4.5–6.0 mm (male), 5.0–7.0 mm (female). Aedeagus – fig. 1: 3. S-W Mongolia.
Ch. aeruginosa alpina L.Medvedev, 1980

15(8) Aedeagus longer, with apex wider, bearing 2 small rounded calli on ventral side. In female, tarsomere 1 ventrally with glabrous triangle from base, tapering apically and reaching about midlength of tarsomere in fore-leg, and with glabrous stripe along full length in mid- and hind-legs. Head and pronotum dark greenish coppery, elytra brownish coppery with green reflection. Pronotum+elytra length: 6.4–7.9 mm (male), 7.1–8.7 (female). Japan (Honshu).
Ch. orochi Takemoto, 2022

16(5) Prothoracic hypomeron without vertical lateral border (Figs. 1: 8; 7: 5).

17(18) Hind wings develop, reaching elytral apex. Elytral rows consist of moderately large or fine punctures; intervals flat or weakly convex. Color of dorsal side variable: 1) violet with blue reflection, with pronotal lateral calli, elytral suture and aureole of elytral punctures violet, 2) bluish green, with pronotum entirely or only at lateral calli, elytral suture and punctures violet, 3) green, with pronotal lateral calli, elytral suture and punctures violet, 4) head bluish green, pronotum and elytra violet with greenish reflection, elytral punctures golden, 5) dorsum black with metallic reflection at pronotal lateral calli and lateral sides of elytra, 6) head blue with vertex violet, pronotum violet purple, elytra greenish blue with violet suture and aureole of punctures, 7) head purplish violet, pronotum green with lateral calli purplish violet, elytra bluish green with suture and aureole of punctures violet, 8) entirely purplish violet, head and pronotum partly bluish, elytral suture and aureole of punctures golden. Antennae dark brown with antennomeres 1 and 2 rufous below and apically. Legs violet. Length: 5.8–6.5 mm (male), 6.8–7.7 mm (female). Aedeagus – fig. 7: 3. Kazakhstan, S Siberia, Mongolia.
Ch. purpurata (Faldermann, 1833)

18(17) Hind wings absent or vestigial. Elytral rows consist of large, usually foveiform punctures. Dorsum shining, brightly metallic (mostly green, purple, and blue).

Ch. perforata (Gebler, 1830)

(a) subsp. *perforata* (Fig. 5). Altai, Tuva, Sayans, N Mongolia. Dorsum green; elytra with weak golden reflection, with suture, punctures, and scutellum violet; or dorsum green, elytra reddish-golden, punctures violet with aureole green; or dorsum green, with pronotal lateral calli and scutellum violet, elytra with golden reflection and with punctures violet. Legs entirely blue or with femora green. Elytron with paired rows of large punctures; intervals flat, or intervals 2, 4, 6, 8 slightly convex. Elytral surface smooth. Aedeagus (Fig. 5: 1–3, 5–7) rounded at apex, without lateral emarginations (or with only very shallow emarginations), ventrally with distinct sub-apical denticles, not "humped" at level of apical orifice; flagellum broad or narrow. Length: 5.2–6.5 mm (male), 6.0–8.0 mm (female).

(b) subsp. *simillima* (Mohr, 1966a) (Fig. 6). Krasnoyarsk Krai, Tuva, N-W Mongolia. Dorsum mostly green or bluish green, with elytral suture and punctures violet. Legs dark metallic or rufous. Elytron with paired rows of fine to large punctures; intervals flat. Elytral surface smooth. Aedeagus (Fig. 6: 1–5) with distinct, mostly deep lateral emarginations before apex, ventrally with distinct sub-apical denticles, less "humped" or not "humped" at level of apical orifice (see from lateral side), flagellum narrow. Length: 5.1–6.6 mm (male), 6.1–6.8 mm (female).

(c) subsp. *turczaninoffi* (Harold, 1875a) (Fig. 7: 6). Sayans, Transbaikalia, N Mongolia, Dzhungaria. Dorsum mostly violet or violet purple, more rarely green or blue with elytral punctures and partly pronotum violet. Legs dark metallic. Elytron with paired rows of large, foveiform, very dense punctures which larger than those in other subspecies; intervals convex, at least, in lateral ½. Elytral surface wrinkled. Aedeagus (Fig. 7: 1, 2) narrowed at sides of apical orifice, ventrally with obtuse or indistinct sub-apical denticles, distinctly "humped" at level of apical orifice (see from lateral side); flagellum narrow. Length: 6.2–7.2 mm (male), 6.8–7.9 mm (female).

19(4) In female, all tarsomeres 1 entirely pubescent beneath. Pygidium with weak impression in basal ½ only. Dorsum moderately shining with elytra sericeous, black with weak bronze reflection. Elytral rows consist of rather fine punctures. Length 5.5 mm. Fig. 4: 1–10. China (Sichuan).

Ch. mauroi Lopatin, 2005a

20(1) North American species. Pygidium with groove along entire length.

21(22) Pronotum broadest at mid-length. Pronotal lateral impression furrow-shaped in basal ¼, wide, obsolete in anterior ¾. Elytral puncturation almost irregular, rather dense, with intervals slightly wrinkled. Hind wings absent. Dorsum moderately shining, dark violet, or with elytra green. Underside and legs dark violet, antennae bluish black. In male all tarsomeres 1-3 entirely pubescent beneath, with only tarsomeres 1 bearing very short glabrous stripe at the base, in female all tarsi with tarsomere 1 bearing broad glabrous stripe along entire length beneath, tarsomere 2 with glabrous stripe along entire length. Length: 5.6–7.5 mm. Aedeagus – fig. 1:4. Canada, USA.

Ch. basilaris (Say, 1824)

22(21) Pronotum broadest basally or before base. Hind wings developed, at least, reaching elytral apex. Elytral punctures arranged in more or less regular rows.

23(24) Prothoracic hypomeron with vertical lateral border separating smooth marginal stripe along entire length. Pronotum with deep lateral impression deep along entire length. In male all tarsomere 1 with narrow glabrous stripe beneath in basal ⅓. In female all tarsomeres 1–2 with wide glabrous stripe beneath. Aedeagus rounded apically (Fig. 1: 1, 2).

Ch. auripennis (Say, 1824)

(a) subsp. *auripennis*. C, S, E USA. Dorsum shining or sericeous shining, head and pronotum dark violet, elytra golden green or coppery; underside and legs violet, antennae brown with blue reflection. Elytral puncture rows regular. Length: 7.0–9.4 mm.

(b) subsp. *schaefferi* Brown, 1962. S-W USA. Dorsum moderately shining, dark violet; underside and legs dark violet, antennae blackish blue. Elytral puncture rows 5–8 more or less irregular. Length: 7.3–7.4 mm (male), 9.4 mm (female).

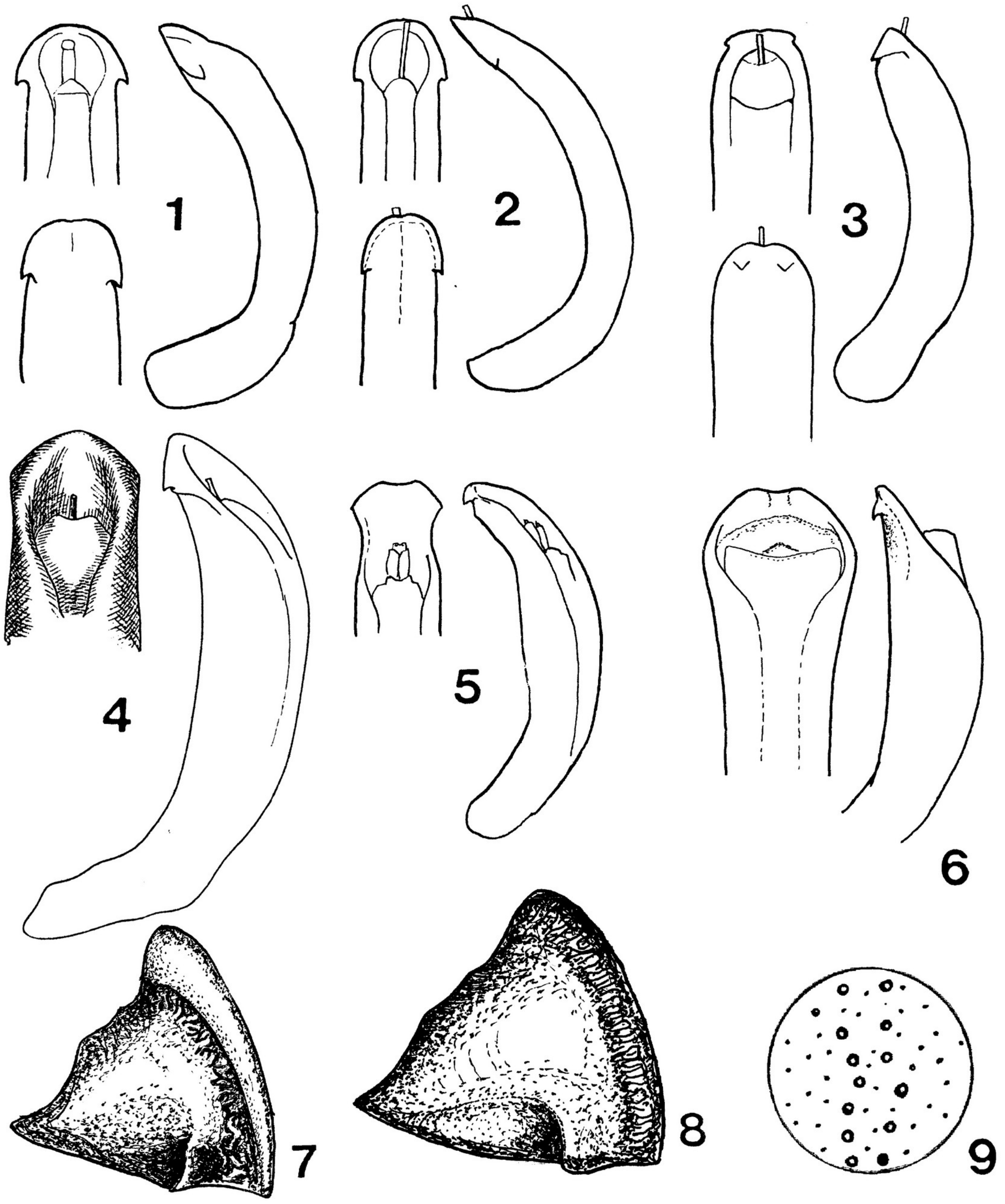
24(23) Prothoracic hypomeron without vertical lateral border. Pronotum with lateral impression deep basally and apically, shallow at mid-length. Aedeagus emarginated at sides of apical orifice (Figs. 1: 5; 3: 1).

25(26) Pronotal lateral impression at mid-length slightly deeper than in the following species. Male larger (7.5 mm long). Dorsum moderately shining. Body, including underside and legs, dark bronze (or with greenish reflection dorsally),with elytra dark brown with strong bronze reflection. In female all tarsomere 1 with narrow glabrous stripe beneath. Length 7.3–7.9 mm. E, S USA.

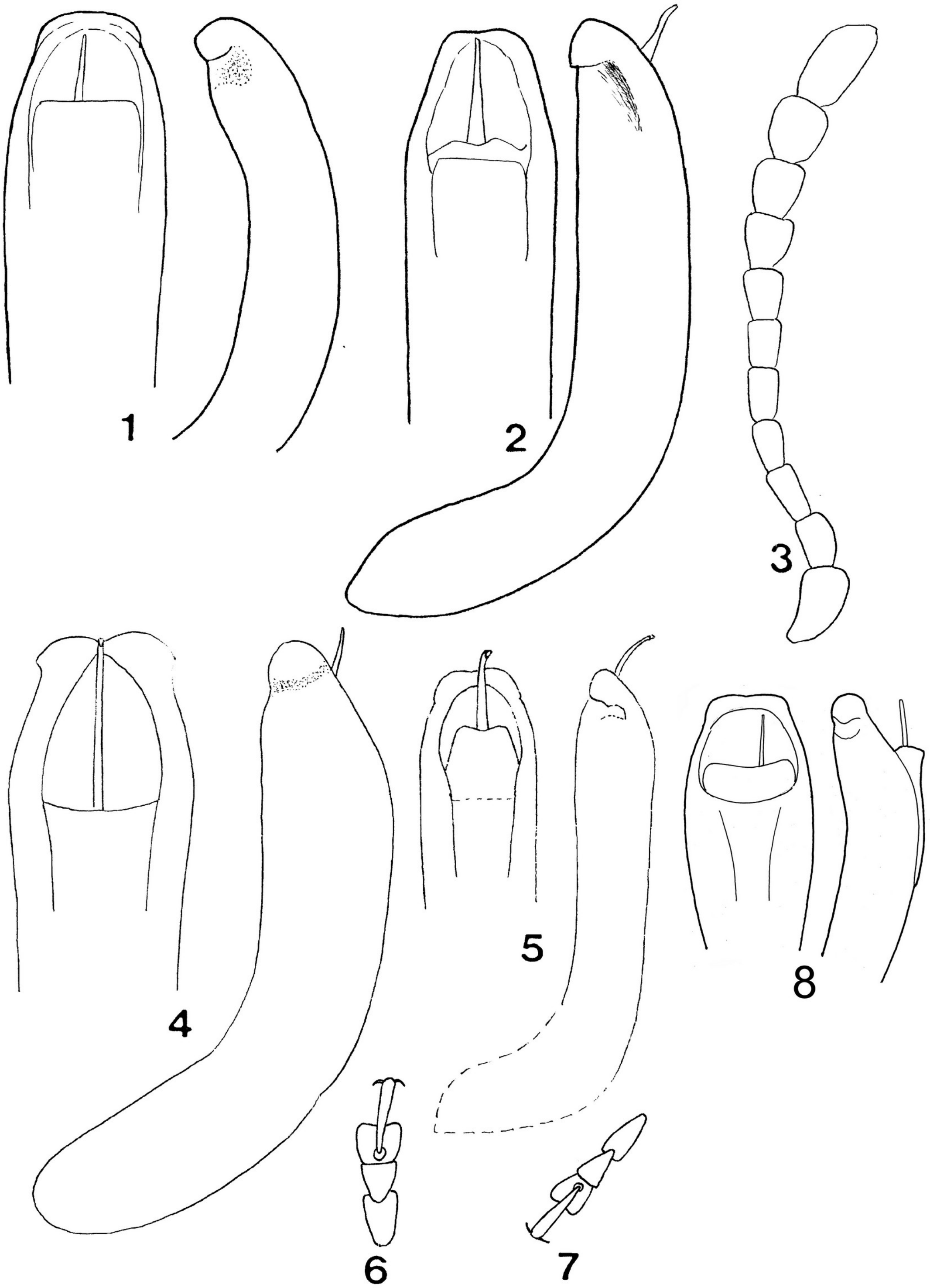
Ch. cribraria (Rogers, 1856)

26(25) Pronotal lateral impression basally deeper, than apically, and very shallow at mid-length (Fig. 3: 2). Male smaller (6.7–7.0 mm long). Head and pronotum moderately shining, elytra sericeous shining. Body, including underside and legs, dark bronze with weak violet reflection, with elytra brown with strong bronze reflection; antennae dark brown, antennomeres 1–4 with weak blue reflection. In male tarsomeres 1–3 of all tarsi with entire sole. Fig. 3: 1–5. Florida.

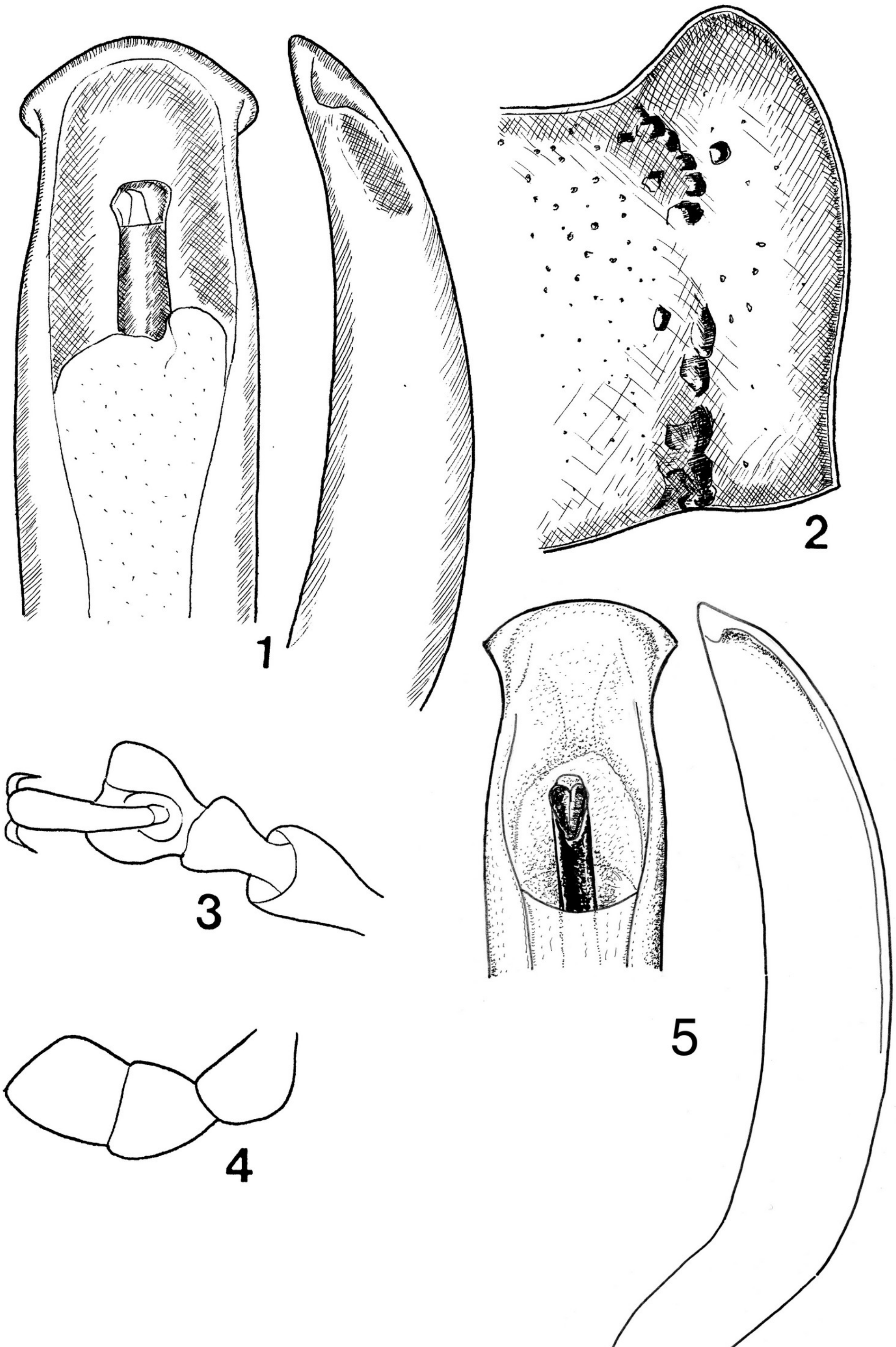
Ch. inornata (Rogers, 1856)



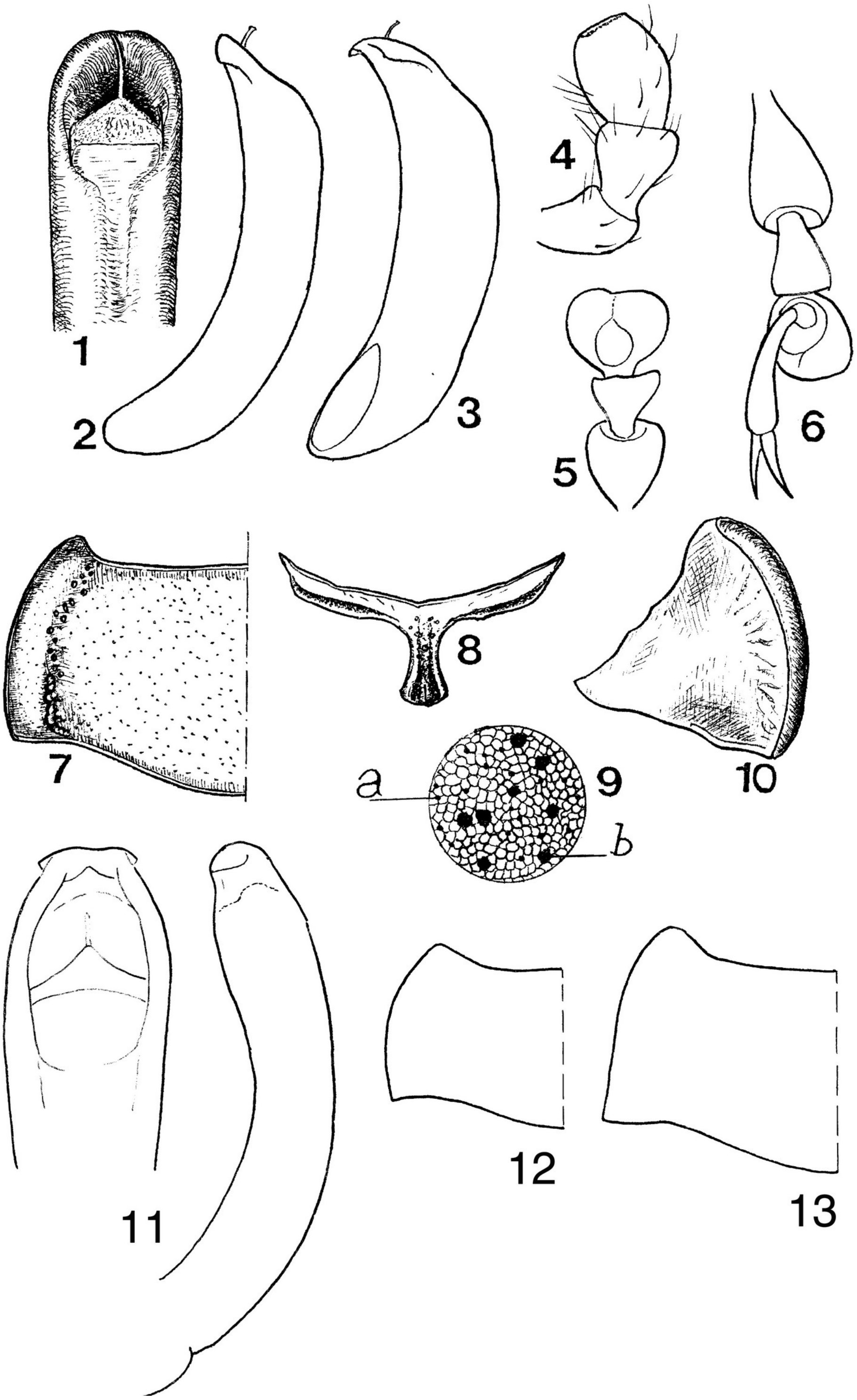
***Allohypericia* figure 1:** 1–4 – male, aedeagus, dorsal, ventral, and lateral view: 1 – *Chrysolina auripennis auripennis* (New Mexico), 2 – *Ch. auripennis schaefferi* (Arizona), 3 – *Ch. aeruginosa alpina* (Mongolia: Baian-Khongor Aimak), 4 – *Ch. basilaris* (California); 5–6 – male aedeagus, dorsal and lateral view: 5 – *Ch. cribraria*, 6 – *Ch. koltzei koltzei* (Siberia: Irkutsk reg.); 7–8 – prothoracic hypomeron: 7 – *Ch. aeruginosa aeruginosa*, female (Mongolia), 8 – *Ch. perforata perforata*, female (Siberia: Tuva); 9 – *Ch. koltzei koltzei*, elytral punctures (Siberia: Irkutsk reg.). (After: Brown, 1962: 4; Jolivet, 1992: 5; others - orig.)



***Allohypericia* figure 2:** 1 – *Chrysolina aeruginosa aeruginosa* (*Taeniosticha instructa*, syntype, Dauria), aedeagus, dorsal and lateral view; 2 – *Ch. peninsularis* (China: Shaanxi), aedeagus, dorsal and lateral view; 3–4 – *Ch. arctica*, male (Wrangel Isl.): 3 – antenna, 4 – aedeagus, dorsal and lateral view; 5–8 – *Ch. peninsularis*: 5–7 – male (Primorsky Krai: Khanka lake): 5 – aedeagus, dorsal and lateral view, 6 – fore-tarsus, 7 – hind-tarsus, 8 – male (syntype, Korea), aedeagus, dorsal and lateral view. (Orig.)

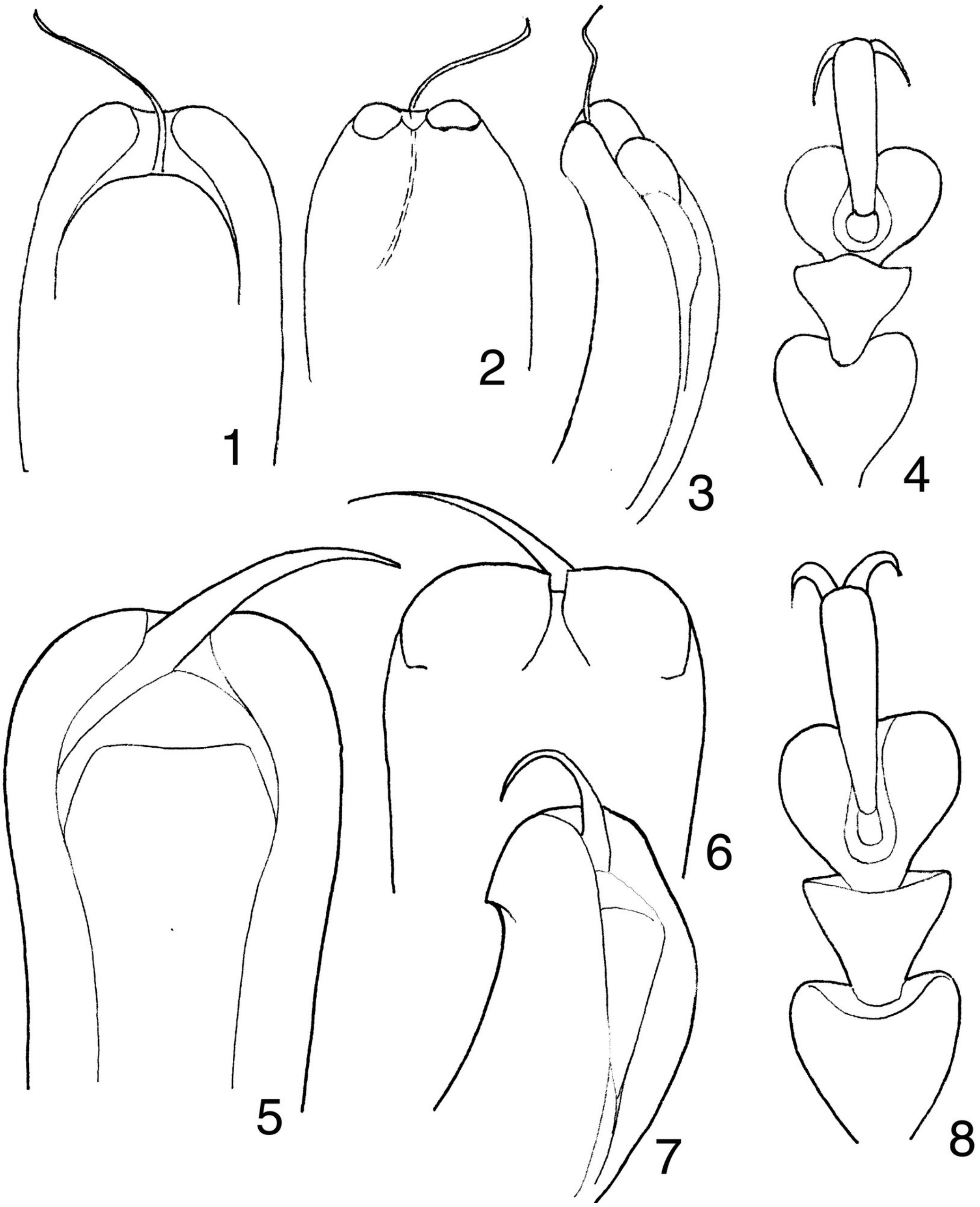


***Allohypericia* figure 3:** *Chrysolina inornata*: 1–4 – male: 1 – aedeagus, dorsal and lateral view, 2 – pronotum, dorsal view, 3 – fore-tarsus, 4 – maxillary palpus; 5 – male (syntype *Ch. subopaca*), aedeagus, dorsal and lateral view. (Orig.)

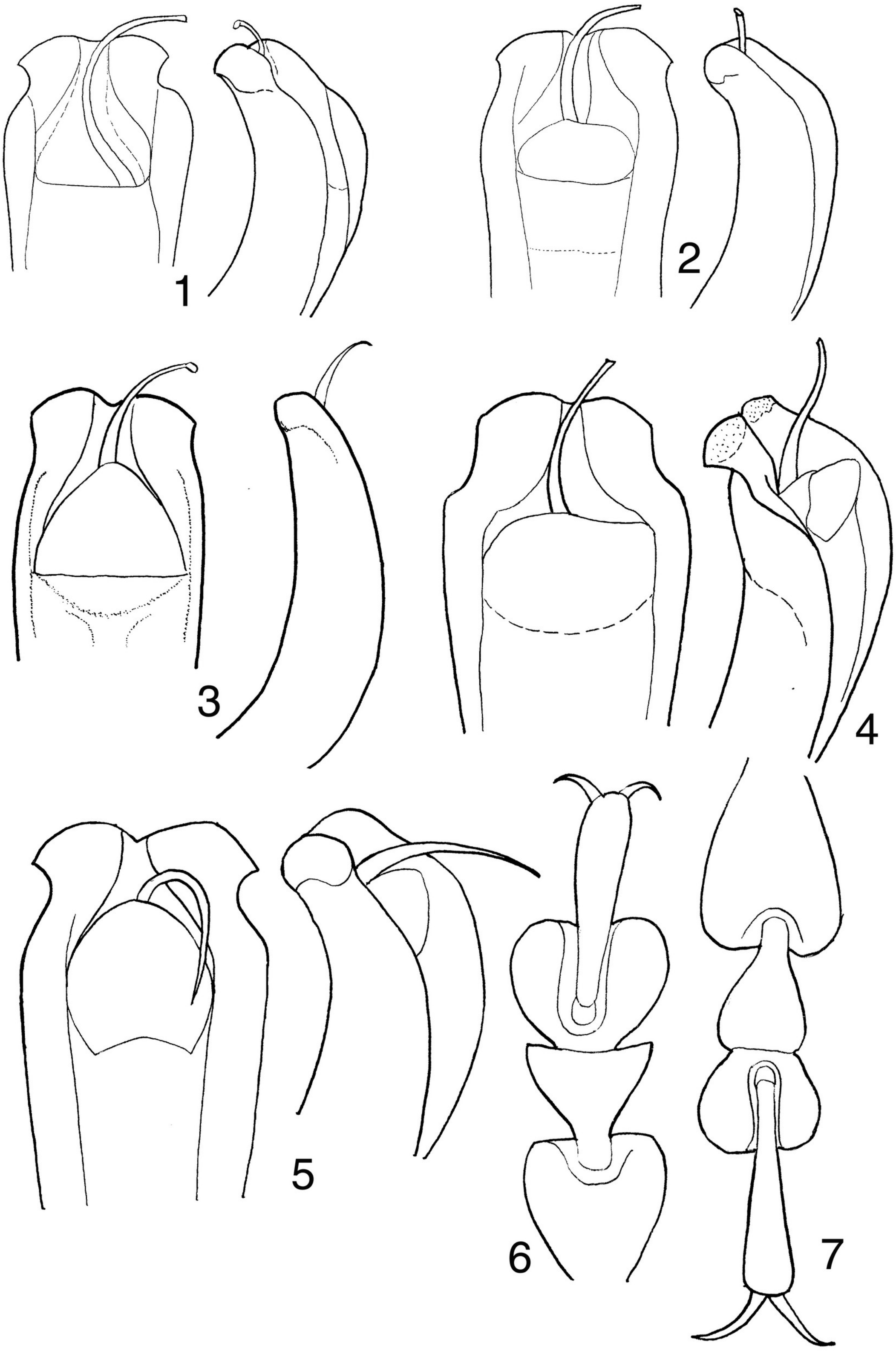


***Allohypericia* figure 4:** 1–10 – *Chrysolina mauroi*, male, holotype (China: Sichuan): 1–3 – aedeagus: 1 – dorsal view, 2 – lateral view, 3 – ventro-lateral view; 4 – maxillary palpus; 5 – fore-tarsus; 6 – hind-tarsus; 7 – pronotum; 8 – prosternum; 9 – microsculpture of pronotum (a – punctules, b – punctures); 10 – prothoracic hypomeron. 11 – *Ch. aeruginosa kabana*, male, holotype (China: Gansu), aedeagus, dorsal and lateral view. 12–13 – pronotum, left ½: 12 – *Ch.*

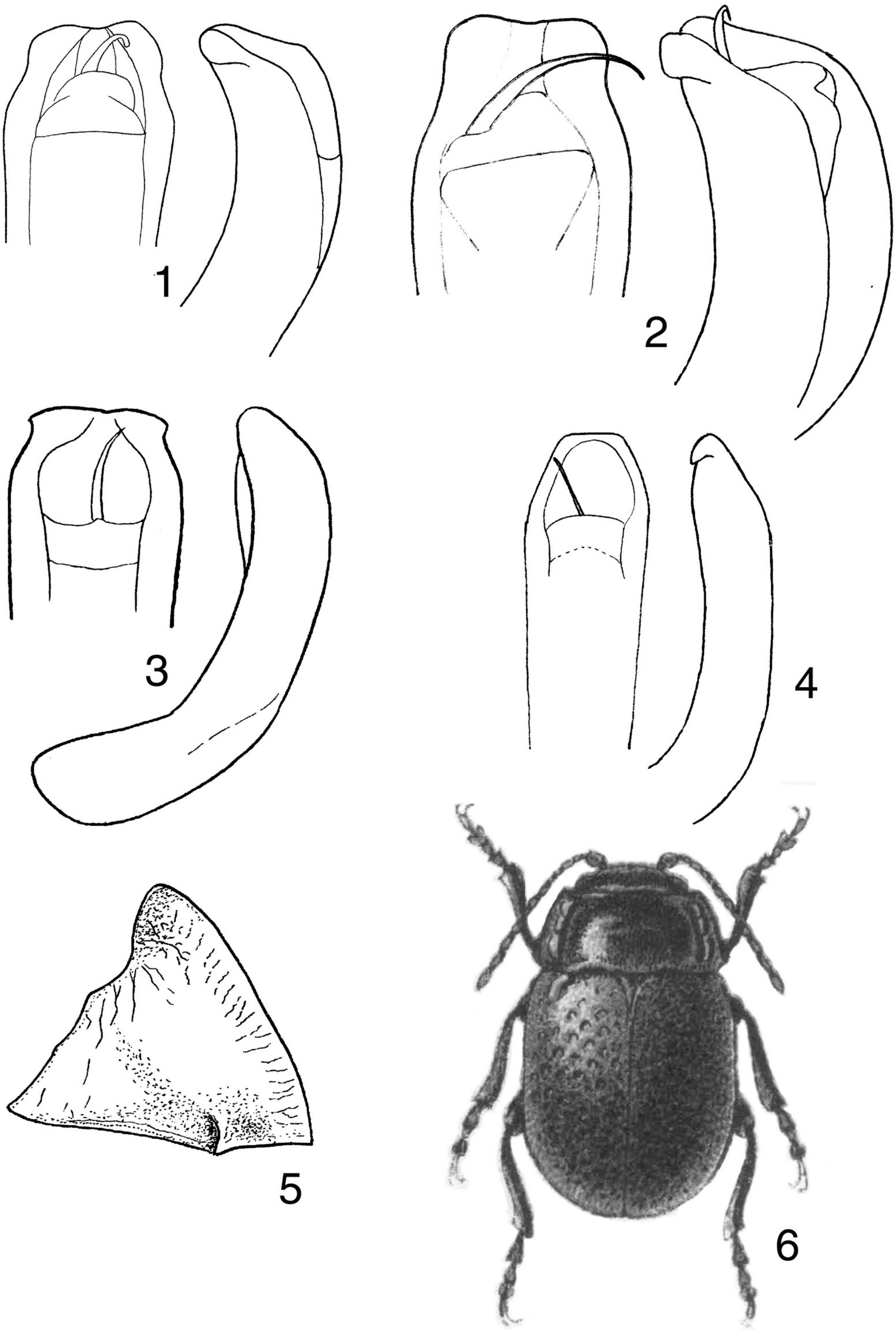
peninsularis, female, 13 – *Ch. aeruginosa aeruginosa*, female (Primorsky Krai). (Orig.)



***Allohypericia* figure 5:** 1–4 – *Chrysolina perforata perforata*, neotype, male (Altai: Barnaul): 1–3 – aedeagus, dorsal, ventral, lateral view, 4 – fore-tarsus; 5–8 – *Ch. perforata perforata*, male (Siberia: Irkutsk): 5–7 – aedeagus, dorsal, ventral, lateral view, 8 – fore-tarsus. (Orig.)



Allohypericia **figure 6:** *Chrysolina perforata simillima*: 1–5 – aedeagus, dorsal and lateral view: 1 – male (*Ch. perforata changaiensis*, holotype, Mongolia), 2 – male (*Ch. perforata pallidipes*, paratype, Mongolia), 3 – male (holotype, "Sibiria"), 4 – male (Mongolia), 5 – male (N-W Mongolia). 6–7 – male (N-W Mongolia), fore- and hind-tarsus. (Orig.)



***Allohypericia* figure 7:** 1–2 – *Chrysolina perforata turczaninoffi*, aedeagus, dorsal and lateral view: 1 – male (*Chrysomela variolosa*, lectotype), 2 – male (N Mongolia). 3 – *Ch. purpurata*, male (Siberia: Krasnoyarsk), aedeagus, dorsal and lateral view. 4 – *Ch. centralasiae*, male (Mongolia: S-Gobi Aimak), aedeagus, dorsal and lateral view. 5 – *Ch. purpurata*, female (N-E

Kazakhstan). 6 – *Ch. perforata turczaninoffi*, total view. (After: Jacobson, 1909: 6; others – orig.)

Subgenus *Anopachys* Motschulsky, 1860a

Diagnosis

Dorsum more or less shining, black or dark metallic, unicolorous, or pronotum and elytra differently colored, or elytra with narrow colored longitudinal stripes.

Last maxillary palpomere almost similar to the penultimate one, not sexually dimorphic in most species, only in *Ch. eurina* it is broader in male than in female.

Pronotum swollen laterally along entire length. Lateral impressions deep to shallow in basal ¼–½, shallow to obsolete anteriorly, covered with large punctures everywhere. Anterior side margined, with setae in most species, without setae in *Ch. koreana*. Anterior setiferous pore absent.

Prothoracic hypomeron convex, weakly or moderately impressed and transversely rugose laterally. Basal fold distinct.

Metasternum entirely marginated anteriorly.

Elytron densely, irregularly punctate, usually having 4–5 smooth shining, somewhat convex or flat longitudinal bands, which are limited by more or less regular puncture rows.

Epipleura visible along entire length in lateral view, with sparse or dense setae apically, only in *Ch. eurina* without setae at all.

Tarsi wholly pubescent beneath in both sexes. Fore-, mid-, and sometimes hind-tarsi more or less enlarged in male. Claw tarsomere without denticles beneath.

Pygidium with longitudinal groove in basal ½ or along entire length in most species, without any groove in *Ch. stalii* only.

Last abdominal sternite: in male: weakly convex, with or without median impression, or flattened; in female: convex and mostly turned back at apex.

Aedeagus long, thin, oval in cross-section, moderately evenly curved, of almost equal width at the entire length; apex of different shape. Flagellum simple, slightly projects beyond apical orifice.

Differential diagnosis

Species of the subgenus *Anopachys* with developed hind wings and ciliate epipleura (*Ch. asclepiadis, Ch. aurichalcea, Ch. relucens, Ch. schatzmayri,* and *Ch. quadrangulata*) sometimes look like *Ch.* (*Chrysomorpha) cerealis* (unicolorous blue or bronze specimens), and differ in shallower and broader pronotal lateral impressions near base, more shining pronotum and elytra, body more convex and more rounded laterally. Besides that, females of the subgenus *Anopachys* differ in last abdominal sternite more convex and usually turned back apically, and males in all but one (*Ch. relucens*) these species differ in aedeagus anchor-shaped apically.

Blue specimens of *Ch. aurichalcea* from the Far East and Hokkaido Isl. externally resemble *Ch.* (*Allohypericia) koltzei lamii*, and differ in aedeagus anchor-shaped apically in male and last abdominal sternite turned back in female.

Asian species without hind wings (*Ch. lineigera, Ch. lineella, Ch. neglecta, Ch. pala, Ch. stalii, Ch. watanabei,* and *Ch. koreana*) externally look like species from the subgenus *Apterosoma*, and differ in pronotum much less constricted or even broadest basally, pronotal puncturation less coarse, and in the absence of "ovipositor" made from pygidium and last abdominal sternite in female.

Chrysolina (*Anopachys) eurina* has developed hind wings and differs from the most *Chrysolina* species from Europe and N Asia in the absence of setae on elytral epipleura.

Key to species and subspecies

1(16) Hind wings developed, at least covering the abdomen. Humeral calli convex.

2(3) Lateral impressions of pronotum covered by broad band of dense, large punctures along entire length (Fig. 1:1). Dorsum black, with or without bronze tinge. Aedeagus broadened and obtuse at apex (Fig. 1: 2). Length 6.6–6.8 mm (male), 7.1–7.5 mm (female). S, E China, Korea.
Ch. gensanensis (Weise, 1900)

3(2) Lateral impressions of pronotum covered by large punctures, arranged more densely near base (Fig. 1: 3, 7; 2: 4; 3: 1, 5: 4: 1; 7: 1). Metallic-shiny or black dorsally. Aedeagus narrowed or anchor-shaped at apex.

4(5) Elytral epipleura without setae. Dorsum weakly shining, shagreened, dark golden bronze or coppery bronze. Aedeagus weakly gradually narrowed laterally from middle to apex, broadly truncate at apex (Fig. 7: 4–7). Last abdominal sternite medially impressed in male (Fig. 7: 3), evenly convex in female. Male tarsomeres 1–3 very broad, especially in fore- and mid-tarsi (Fig. 7: 2). Length 4.5–6.0 mm (male), 7.5–8.0 mm (female). Fig. 7: 1–8. Europe, S Siberia.
Ch. eurina (Frivaldszky, 1883)

5(4) Elytral epipleura with dense or sparse setae apically as in Figs. 2: 5; 4: 7. Dorsum shining. Aedeagus with parallel sides along almost entire length. Last abdominal sternite flat or weakly convex, sometimes with small transverse depression in male, convex and more or less turned back in female. Male tarsomeres 1–3 moderately or weakly broadened.

6(7) Aedeagus slightly narrowed at sides of apical orifice, broadly rounded and weakly impressed at apex (Figs. 1: 4; 2: 1). Dorsum very shining,

coloration varies: 1) head and pronotum black with blue, violet, brassy or bronze tinge, elytra violet, brassy, violetish black with bronze tinge, or greenish bronze black, 2) unicolorous, dark bronze, brassy, black, or blue with weak green and violet tinge. Length 5.9–6.9 mm (male), 6.0–7.9 mm (female). Figs. 1: 3; 2: 12. Alps, White Sea shore, Urals, Siberia, Far East.
Ch. relucens (Rosenhauer, 1847)

7(6) Aedeagus anchor-shaped at apex.

8(11) Pronotal lateral calli very swollen anteriorly, lateral impressions anteriorly shallow but distinct. Pronotal disc finely punctate, punctures becoming very fine to obsolete towards lateral impressions. Elytral epipleura sparsely ciliate apically (Fig. 4: 7). Antennomeres 1–2, or 1–5, or 1–6 entirely rufous.

9(10) Apical denticles of aedeagus strongly projecting downwards in lateral view (Fig. 4: 3). Dorsum moderately shining, blue, elytra sometimes violet. Length 7.5–8.0 mm (male), 8.6–9.4 mm (female). Figs. 2: 10; 5: 1.
Ch. asclepiadis asclepiadis

10(9) Apical denticles of aedeagus slightly projecting downwards in lateral view (Fig. 4: 4–6). Dorsum blue or violet in specimens from W Europe, Ukraine, Azerbaijan, Kazakhstan, Kyrgyzstan, bronze in that from European Russia and Urals. Length 6.0–7.3 mm (male), 7.1–8.6 mm (female). Fig. 5: 3.
Ch. asclepiadis bohemica (G. Müller, 1948)

11(8) Pronotal lateral calli moderately or slightly convex, especially anteriorly, lateral impressions absent or obsolete anteriorly. Pronotal disc usually moderately largely punctate, punctures not finer towards lateral impressions. Elytral epipleura densely ciliate apically (Fig. 2: 5). Antennae dark with antennomeres 1–2 rufous below or 1–3 rufous apically

12(13) Species from Adriatic Sea shore and islands of Gulf of Venice. Aedeagus large, apical triangle 0.3 mm long, 0.6 mm wide, apical margin broadly rounded, emarginations before lateral angles obsolete (Fig. 1: 6). Dorsum coppery with greenish tinge. Antennomeres 1–3 rufous apically. Length 7.3 mm (male), 7.9–8.2 mm (female). Figs. 1: 5–8; 2: 11; 5: 2. N-E Italy.
Ch. schatzmayri (G.Müller, 1916)

13(12) Species from E Europe, Kazakhstan, Kyrgyzstan, Siberia, the Far East, China, and Vietnam. Antennomeres 1–2 rufous below.

14(15) Apical triangle of aedeagus short, as wide as aedeagus before apical orifice or narrower, emarginations before lateral angles deeper (Figs. 2: 2, 3, 6–9; 3: 3, 4, 7–9; 6). Dorsum black, bronze, coopery, violet, green, blue, or bicolorous: pronotum violet, elytra bronze, or dorsum bronze with only pronotal lateral calli violet. All specimens from Europe are bronze or coppery. Length 5.3–8.3 mm (male), 6.5–9.6 mm (female). Figs. 2: 2–9; 3: 1–11; 4: 1; 5: 4; 16: 1–12. E Europe, Siberia, C Asia, Far East, China, Japan, Mongolia, Vietnam, Laos.
Ch. aurichalcea (Gebler in: Mannerheim, 1825)

15(14) Apical triangle of aedeagus long, as broad as aedeagus before apex or broader; emarginations before lateral angles shallower (Figs. 4: 2; 6). Coloration varies: specimens from Altai, Tuva, Sayans and Mongolia are coppery, black or bronze, rarely blue, green or violet; specimens from Yakutia are green, those from Magadan reg. are blue or violet. Length 5.7–7.5 mm (male), 4.0–7.8 mm (female). Fig. 5: 5. E Siberia, Far East, Mongolia.

Ch. quadrangulata (Motschulsky, 1860a)

16(1) Hind wings reduced, not longer than metathorax, or absent. Humeral calli absent or very weak. (*Ch. stalii* belongs to this group. However, their taxonomical position is uncertain because only female specimen is known; body shining dorsally, brown with strong golden reflection; pronotal disk smooth, impunctate; elytral epipleura densely ciliate apically. It externally resembles *Ch. relucens*, but differs in hind wings absent. Fig. 4: 8, 9).

17(24) Aedeagus narrowed at sides of apical orifice.

18(19) Aedeagus narrowly drawn out, flagellum apically diamond-shaped (Fig. 12: 4). Pronotum broadest basally (Fig. 15: 3). Male 7.4–7.5 mm long, female 8.5 mm long. Head and pronotum sericeous, shagreened, elytra shining, smooth. Body dark violet. Fig. 15. Korea.

Ch. koreana Chûjô, 1941

19(18) Aedeagus with flagellum narrow apically (Figs. 9: 2–7; 10: 1, 5; 11: 2–5; 12: 1–3). Pronotum broadest near mid-length. Male 5.8–7.3 mm long.

20(23) Aedeagus apically broadly truncate or narrowly drawn out, apical orifice covered by membrane only in basal ⅛–¼. Dorsal coloration varies, sometimes with longitudinal elytral bands differently colored, rarely entirely dark violet. Pronotal lateral impressions usually broad and deep in basal ½.

21(22) Flagellum of aedeagus with sclerotized lateral "wings" (Fig. 9: 2–7). Spermatheca gradually broadened from base, and rounded at apex (Fig. 14: 1–4). Dorsum shining, pronotum and elytra shagreened or smooth; coloration varies: 1) dark bronze with pronotum brassy, elytra green, 2) bronze with elytra having 4 brassy or green bands, 3) wholly dark violet, 4) bronze or violet with coppery elytra having 5 brassy bands, 5) black with elytra violet, 6) coppery with golden or purplish tinge, 7) reddish-purple, 8) blue. Length 6.1–7.3 mm (male), 6.6–7.7 mm (female). Figs. 9: 1; 13: 3. E Siberia, Far East.

Ch. lineigera (Jacobson, 1901b)

22(21) Flagellum of aedeagus narrow, without lateral "wings", broadest basally (Figs. 11: 2–5; 12: 1). Spermatheca (Fig. 14: 13–17) hook-shaped, constricted in basal part, rounded at apex. Dorsum shining, pronotum shagreened or smooth, dorsal coloration variable: 1) head black with weak violet or bronze reflection, with frons blue; pronotum black with weak bronze reflection, pronotal calli with violet reflection; scutellum blue; elytra coppery having 5 brassy bands (at elytral intervals 1, 3, 5, 7, and 10); 2) dorsum entirely dark violet or with pronotum (except lateral calli) dark green. Length 6.7–7.3 mm (male), 7.3–8.4 mm (female). Figs. 11: 1–7; 13: 5. Primorsky Krai, Hokkaido, N-E China.

Ch. watanabei Takizawa, 1970

23(20) Apical projection of aedeagus narrowly drawn out, restricted at its base and broadened toward apex, apical orifice covered by membrane in basal ½ (Fig. 10: 1, 2, 3, 5). Flagellum of aedeagus narrow, without lateral "wings", broadest at mid-length (Fig. 10: 1, 5). Spermatheca constricted in basal part, sharpened at apex (Fig. 14: 5–8). Dorsum dark violet, rarely dark brassy, never bronze or bicolorous. Pronotal lateral impressions narrow and shallow basally. Length 5.2–6.3 mm (male, fig. 10: 4, 6), 6.1–7.0 mm (female, figs. 10: 7; 13: 1, 2). Khabarovsk Krai, Primorsky Krai.

Ch. neglecta Bieńkowski, 1998

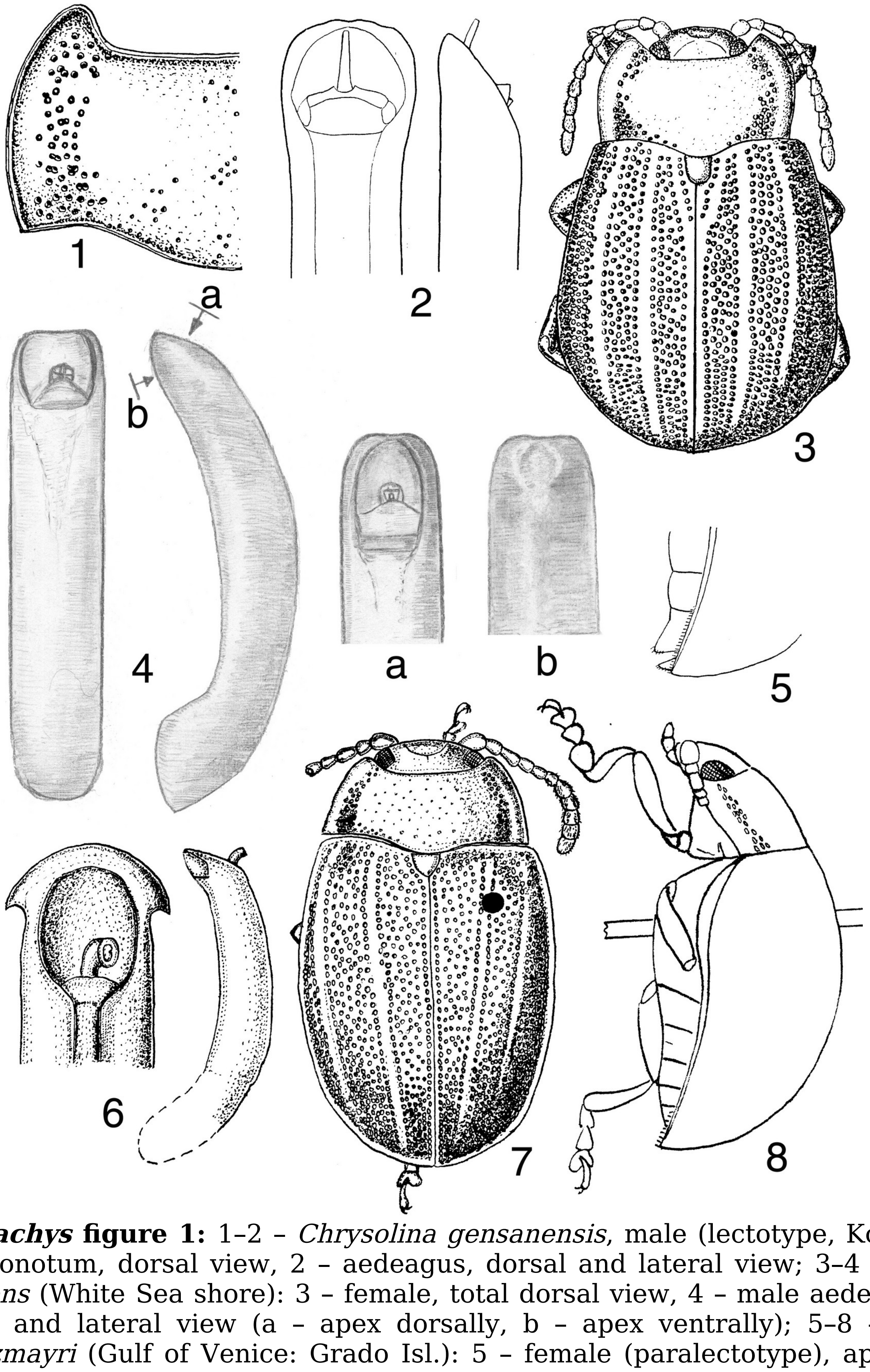
24(17) Aedeagus slightly broadened at sides of apical orifice.

25(26) Aedeagus oval in cross-section, rounded and sometimes truncate at apex (Fig. 8). Dorsal coloration varies: 1) dark bronze or violet with coppery elytra having suture and 4 longitudinal bands brassy green; 2) brassy, elytra with green bands, 3) black with metallic tinge, elytra with dark coppery bands; 4) head, pronotum, and scutellum black, elytra violet. Length 7.2–7.6 mm (male), 6.8–8.7 mm (female). Figs. 7: 9; 8; 13: 4; 14: 9–12). Far East.

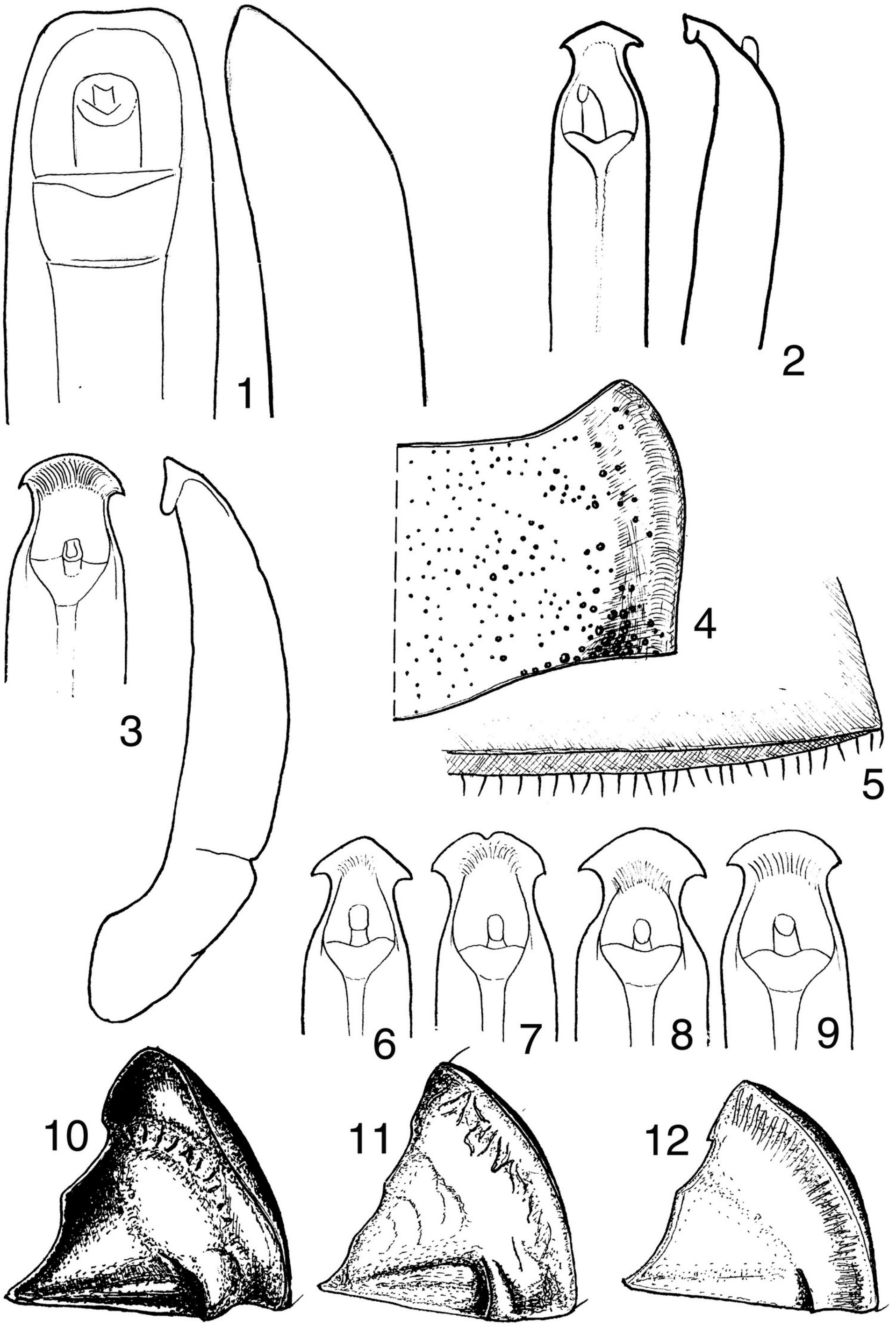
Ch. lineella (Weise, 1887a)

26(25) Aedeagus depressed in cross-section, triangular at apex (Fig. 12: 2, 3). Dorsum blackish violet with head and pronotum blackish blue or entirely dark bronze. Length 6.6 mm (male), female is unknown. Khabarovsk Krai, Primorsky Krai.

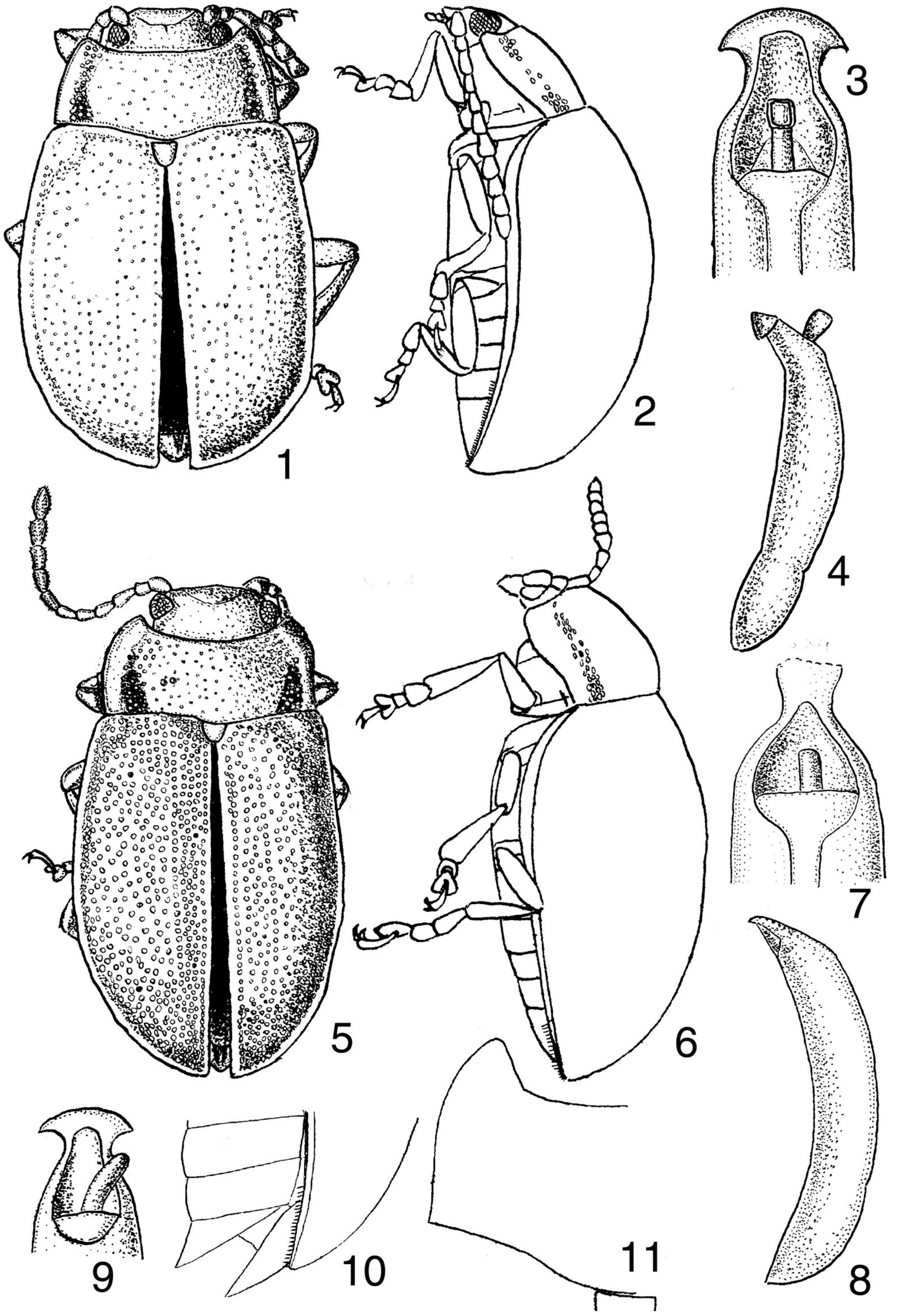
Ch. pala Bieńkowski, 1998



***Anopachys* figure 1:** 1–2 – *Chrysolina gensanensis*, male (lectotype, Korea): 1 – pronotum, dorsal view, 2 – aedeagus, dorsal and lateral view; 3–4 – *Ch. relucens* (White Sea shore): 3 – female, total dorsal view, 4 – male aedeagus, dorsal and lateral view (a – apex dorsally, b – apex ventrally); 5–8 – *Ch. schatzmayri* (Gulf of Venice: Grado Isl.): 5 – female (paralectotype), apex of abdomen and elytron, lateral view, 6–8 – male (lectotype): 6 – aedeagus, dorsal and lateral view, 7 – total dorsal view, 8 – total lateral view. (Orig.)

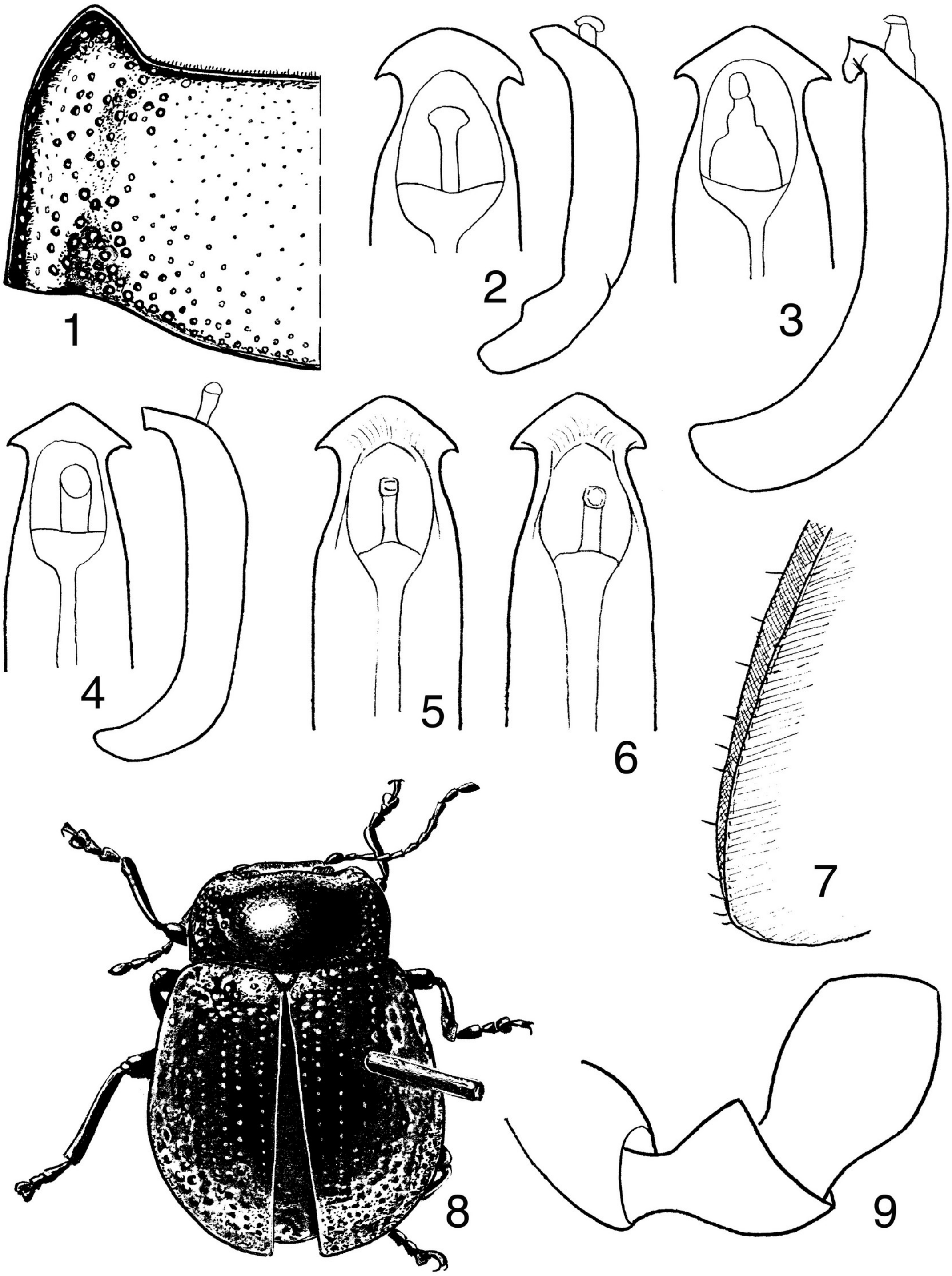


***Anopachys* figure 2:** 1 – *Chrysolina relucens*, male (Siberia, Irkutsk), aedeagus, dorsal and lateral view; 2–9 – *Ch. aurichalcea*: 2 – male (syntype *Ch. aurichalcea vagesplendens*), aedeagus, dorsal and lateral view; 3–4 – male (lectotype *Ch. elevata*): 3 – aedeagus, dorsal and lateral view, 4 – pronotum; 5 – male (Moscow reg.), apex of elytral epipleura laterally, 6–9 – variability of aedeagus in specimens from the same locality (Moscow); 10–12 – prothoracic hypomeron: 10 – *Ch. asclepiadis asclepiadis* (Switzerland), 11 – *Ch. schatzmayri* (Gulf of Venice), 12 – *Ch. relucens* (Murmansk reg.). (Orig.)

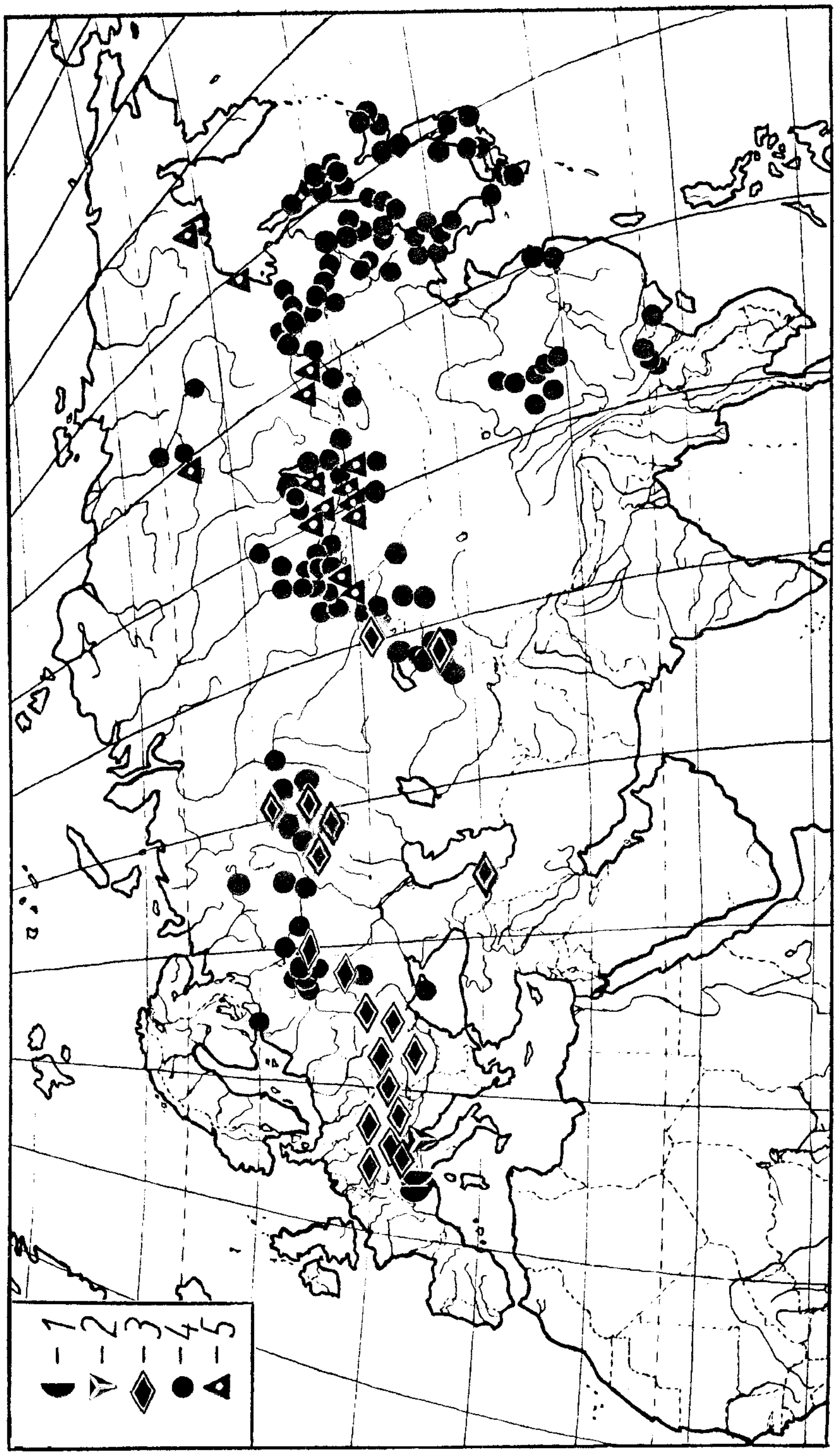


***Anopachys* figure 3:** *Chrysolina aurichalcea*: 1–4 – male (lectotype *Ch. aurichalcea omisiensis*, Sichuan): 1 – dorsal view, 2 – lateral view, 3 – aedeagus, dorsal view, 4 – aedeagus, lateral view; 5–8 – male (lectotype *Ch. aurichalcea kwanghsiensis*, Sichuan): 5 – dorsal view, 6 – lateral view, 7 – aedeagus, dorsal view (apex destroyed), 8 – aedeagus, lateral view; 9 – male (topotype *Ch. aurichalcea kwanghsiensis*, Sichuan), aedeagus, dorsal view;

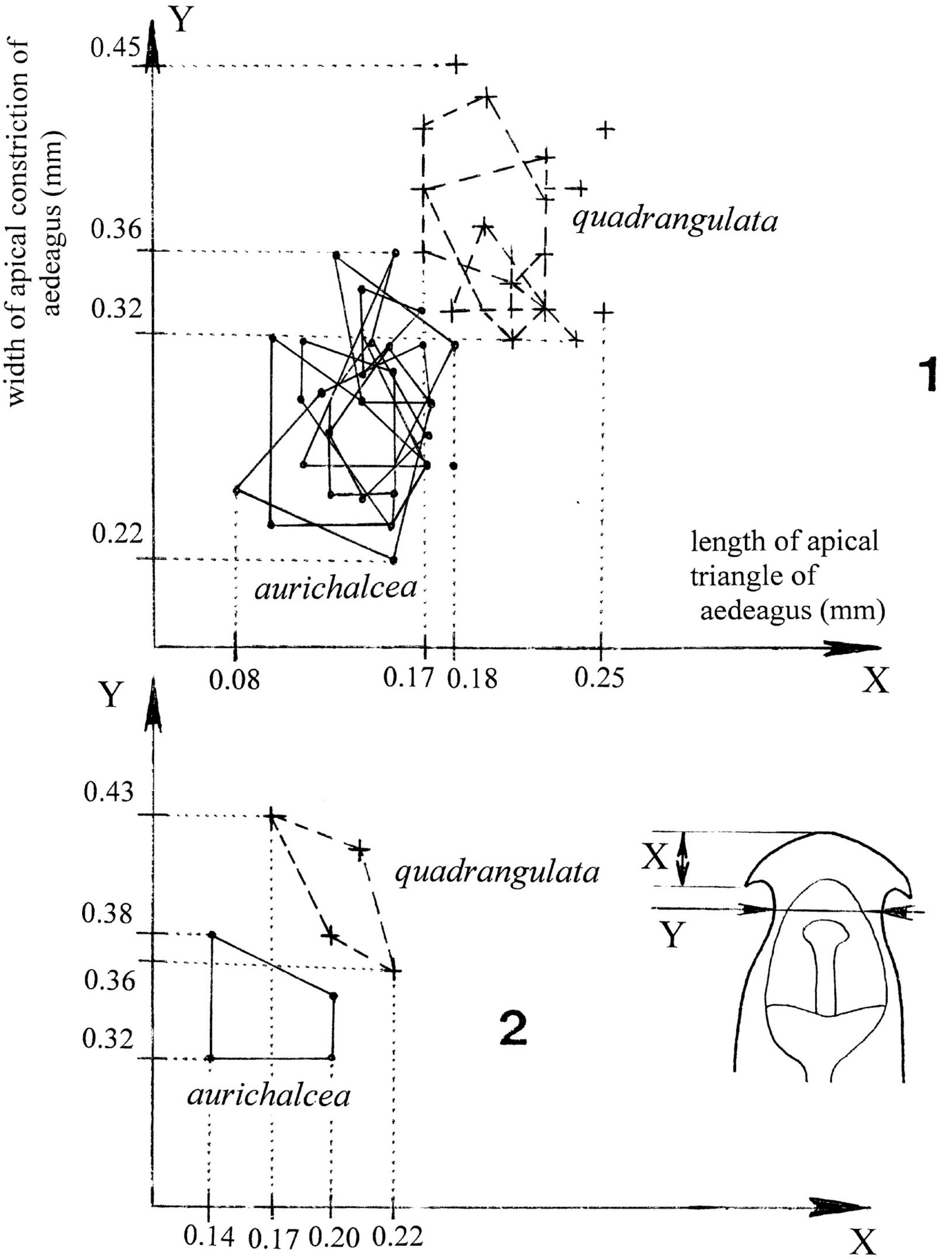
10–11 – female (paralectotype *Ch. aurichalcea kwanghsiensis*, Sichuan): 10 – apex of abdomen laterally, 11 – pronotum. (Orig.)



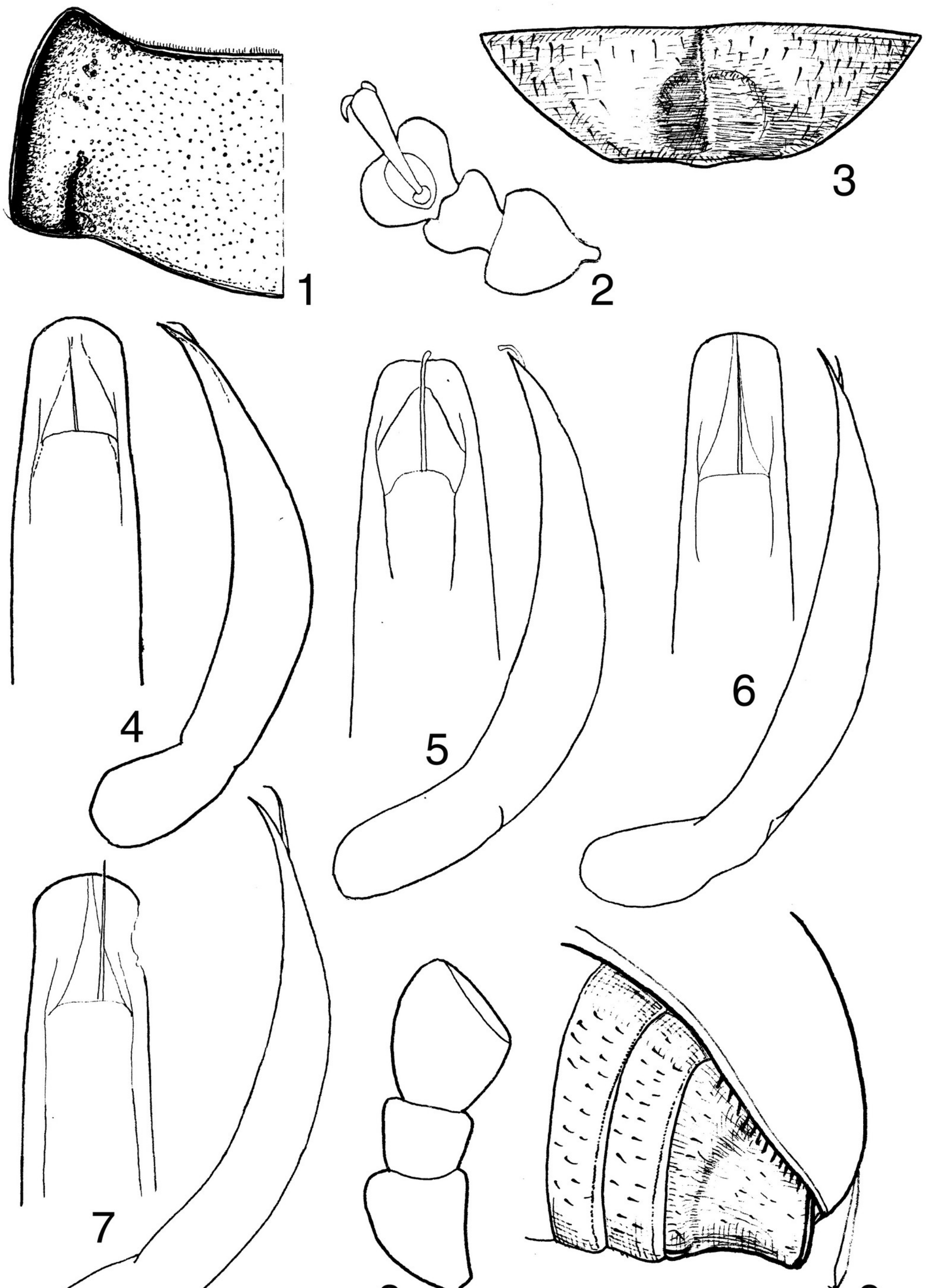
***Anopachys* figure 4:** 1 – *Chrysolina aurichalcea*, female (European Russia), pronotum; 2 – *Ch. quadrangulata*, male (paralectotype, Transbaikalia), aedeagus, dorsal and lateral view; 3 – *Ch. asclepiadis asclepiadis*, male (Switzerland), aedeagus, dorsal and lateral view; 4–7 – *Ch. asclepiadis bohemica*: 4 – male (Ukraine), aedeagus, dorsal and lateral view, 5–6 – male, aedeagus, dorsal view: 5 – European Russia: Kursk reg., 6 – S Urals: Chelyabinsk reg.; 7 – female (S Urals: Chelyabinsk reg.), apex of left elytron, lateral view; 8–9 – *Ch. stalii*, female (syntype, China): 8 – dorsal view, 9 – maxillary palpus. (Orig.)



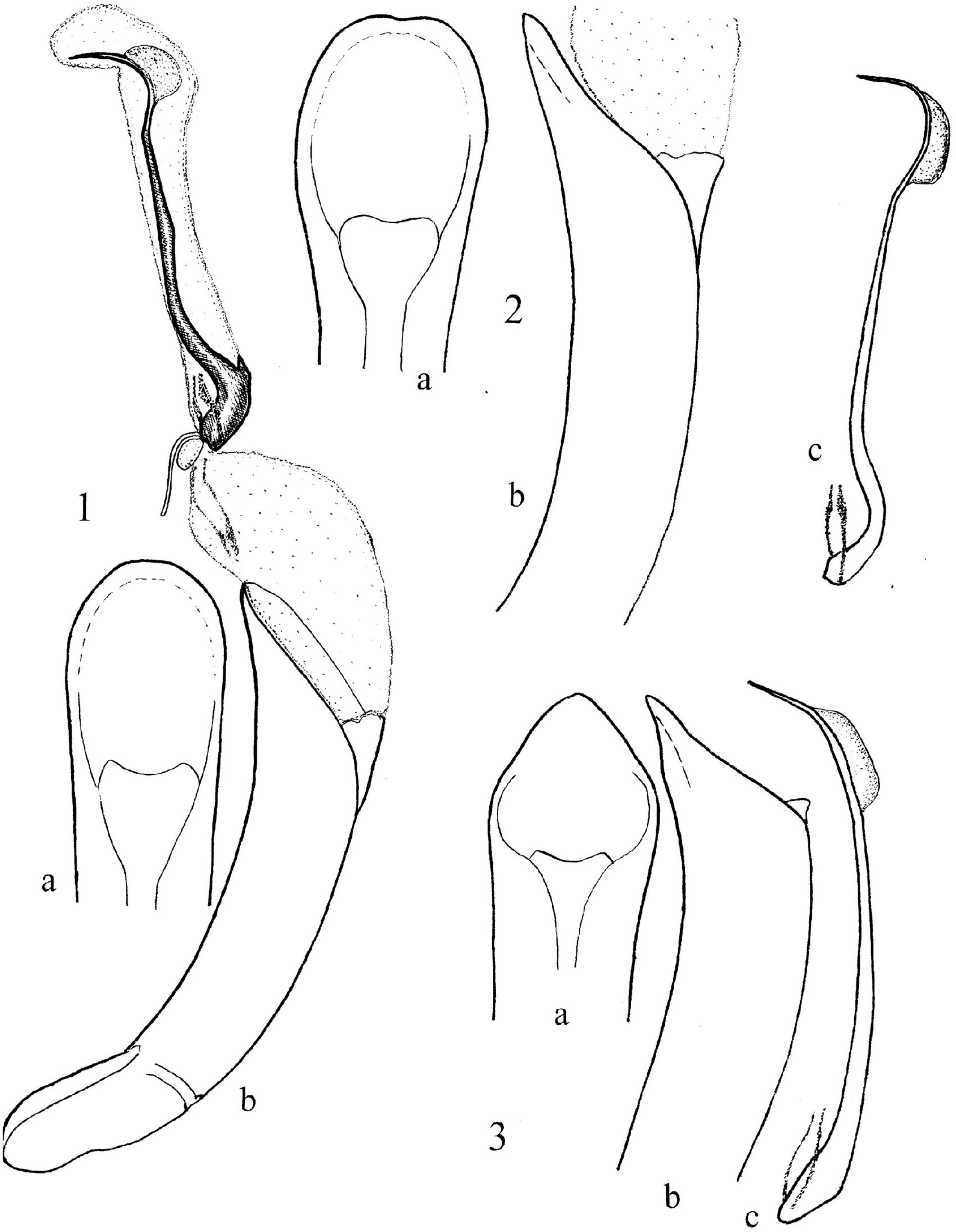
***Anopachys* figure 5:** Distribution: 1 – *Chrysolina asclepiadis asclepiadis,* 2 – *Ch. schatzmayri,* 3 – *Ch. asclepiadis bohemica,* 4 – *Ch. aurichalcea,* 5 – *Ch. quadrangulata.* (Orig.)



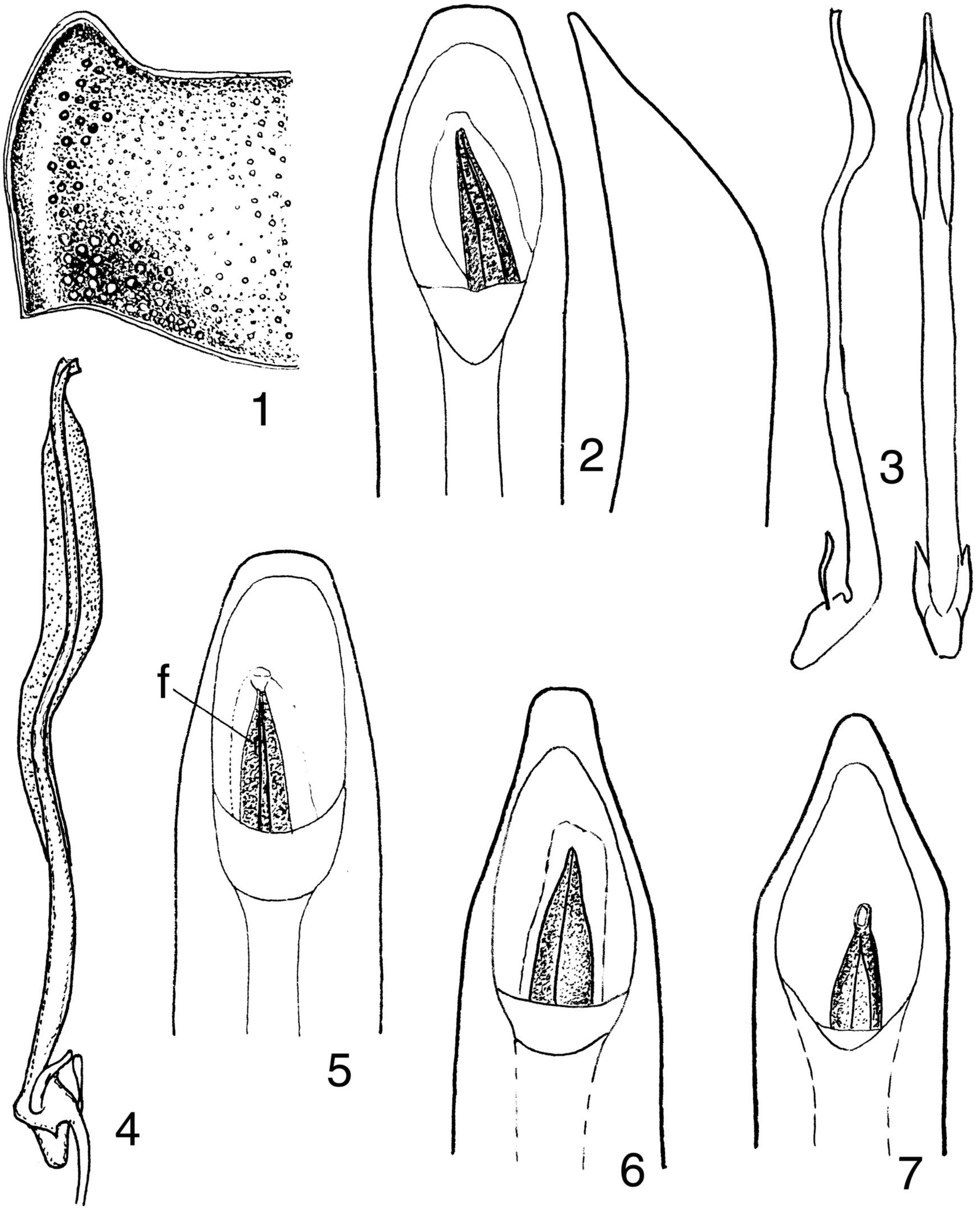
***Anopachys* figure 6:** Aedeagus ratio in *Chrysolina aurichalcea* and *Ch. quadrangulata*: 1 – from Altai, Tuva, Sayans, Transbaikalia, and Mongolia (*Ch. aurichalcea*: 97 males from 28 localities; *Ch. quadrangulata*: 34 males from 13 localities), 2 – from Yakutia (*Ch. aurichalcea*: 10 males from two localities; *Ch. quadrangulata*: 4 males from one locality). (Orig.)



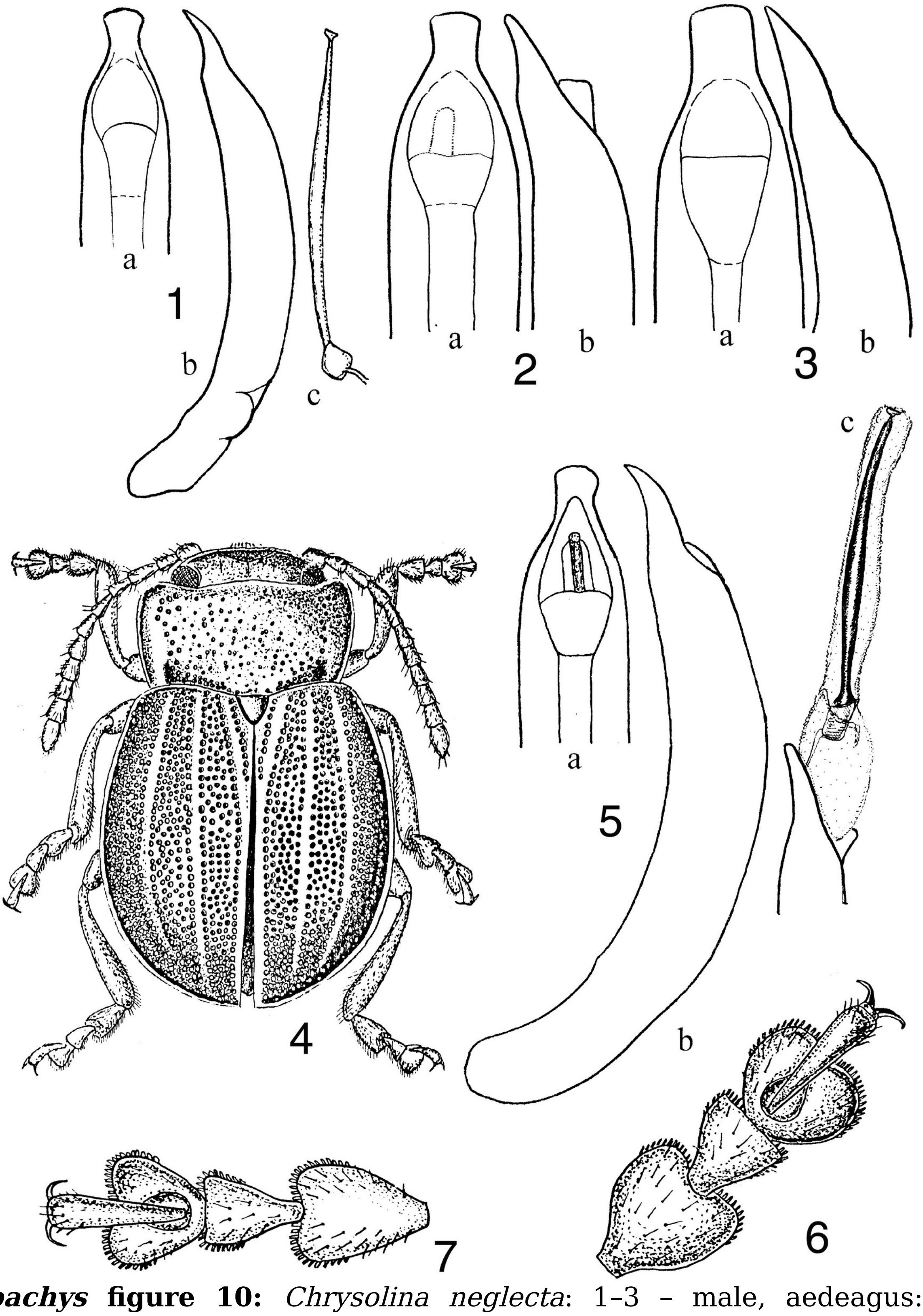
***Anopachys* figure 7:** 1–8 – *Chrysolina eurina*: 1 – female (European Russia: Tambov reg.), pronotum, 2 – male (Moscow reg.), fore-tarsus, 3 – male (Siberia: Kemerovo reg.), last abdominal sternite, 4–7 – aedeagus, dorsal and lateral view: 4 – Siberia: Kemerovo reg., 5 – Moscow reg., 6 – Austria (syntype *Ch. perplexa*), 7 – Hungary (syntype *Ch. eurina*), partly destroyed at apex; 8 – male (Moscow reg.), maxillary palpus; 9 – *Ch. lineella*, female (Far East: Primorsky Krai), apex of abdomen, lateral view. (Orig.)



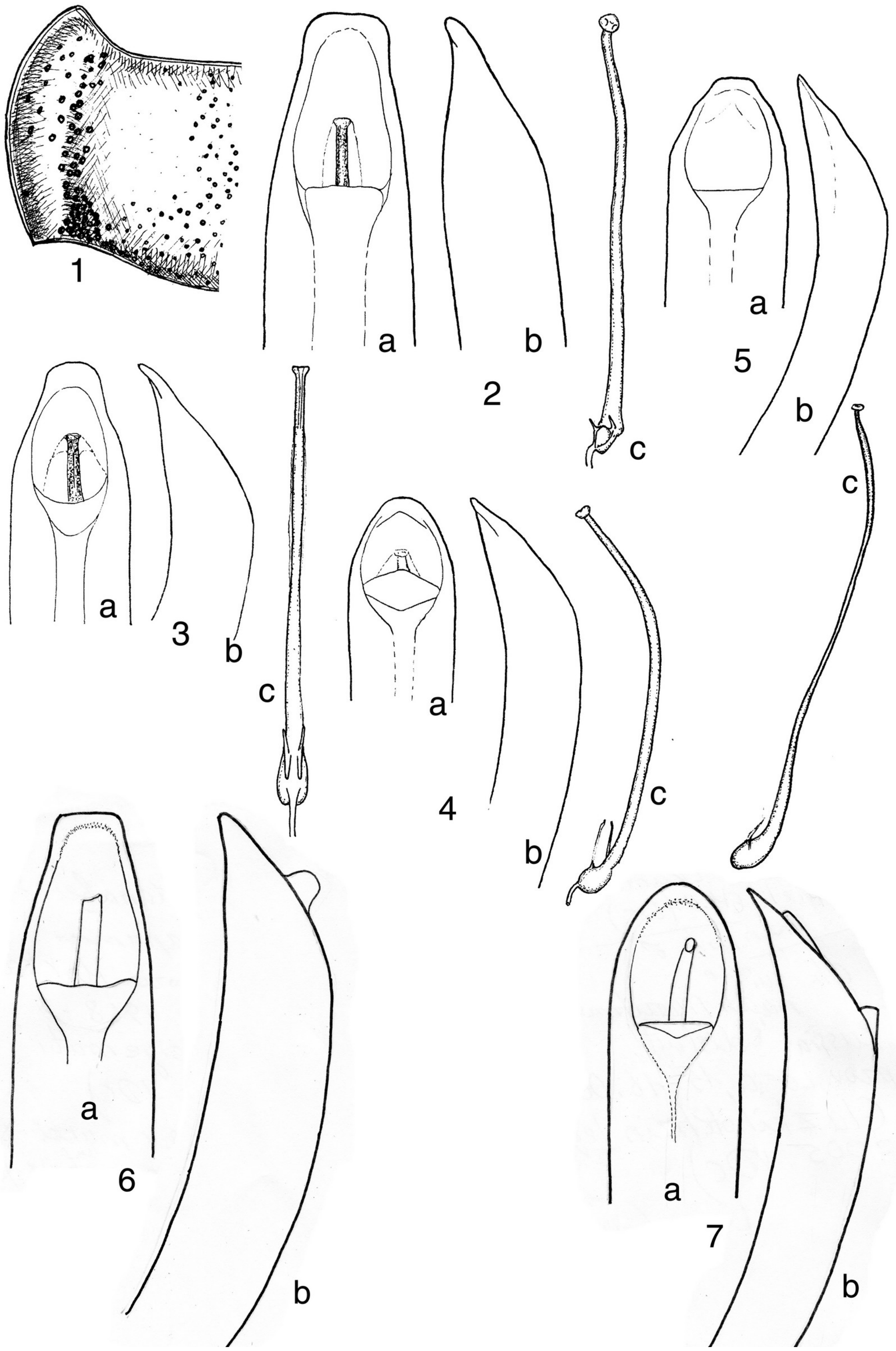
***Anopachys* figure 8:** *Chrysolina lineella*, male, aedeagus (a – dorsal view, b – lateral view, c – flagellum): 1 – Far East, Primorsky Krai, Yakovlevka Vill.; 2 – Far East, Primorsky Krai, Krivoy Kliuch Vill.; 3 – Far East, Primorsky Krai, Anisimovka Vill. (Orig.)



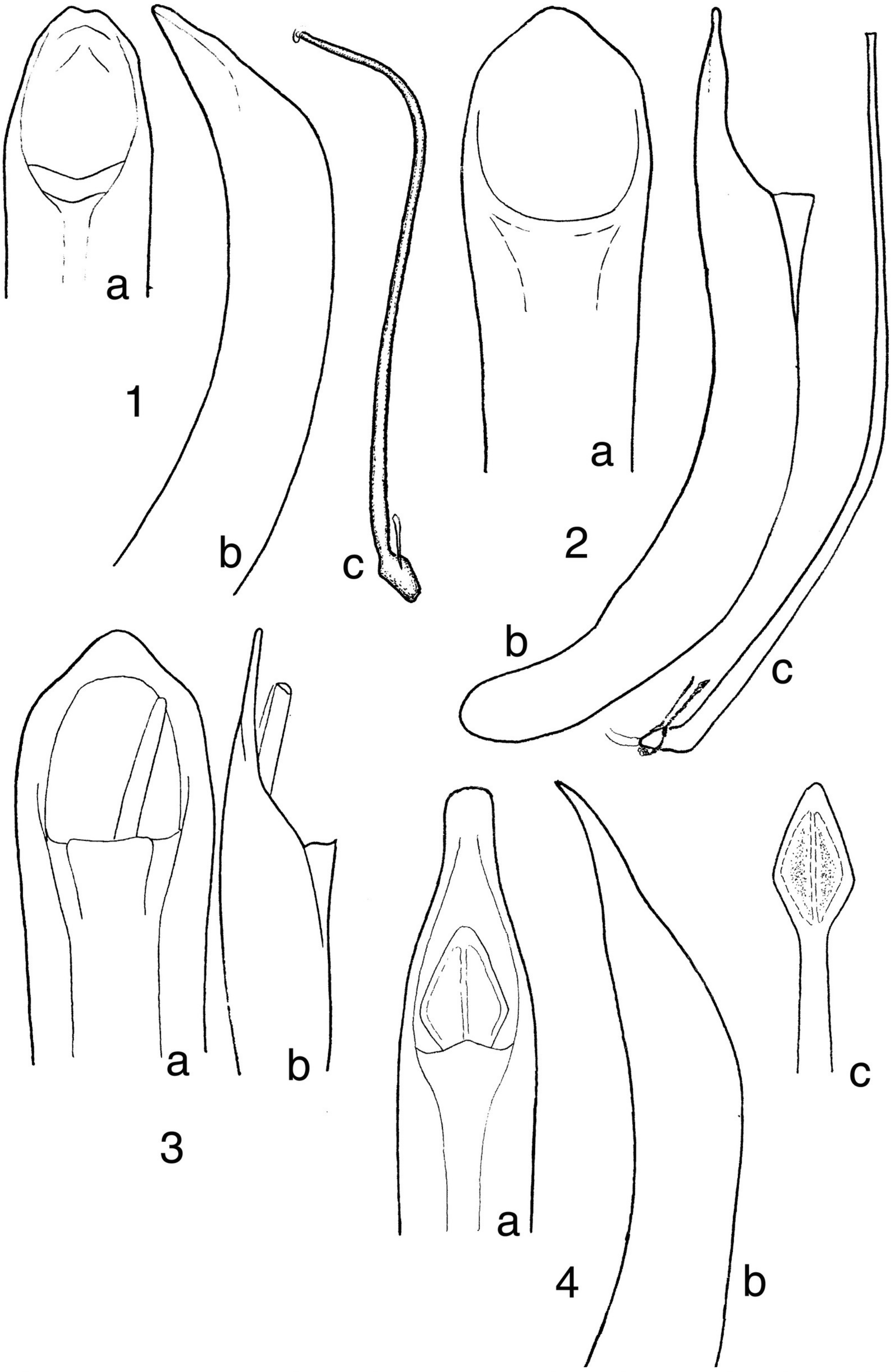
***Anopachys* figure 9:** *Chrysolina lineigera*: 1–3 – male (lectotype, Transbaikalia): 1 – pronotum, 2 – aedeagus, dorsal and lateral view, 3 – flagellum; 4–5 – male (Far East: Sikhote-Alin Mts.): 4 – flagellum, 5 – aedeagus, dorsal view (f – flagellum); 6 – male (Far East: Sikhote-Alin Mts.), aedeagus, dorsal view, 7 – male (Far East: Primorsky Krai), aedeagus, dorsal view. (Orig.)



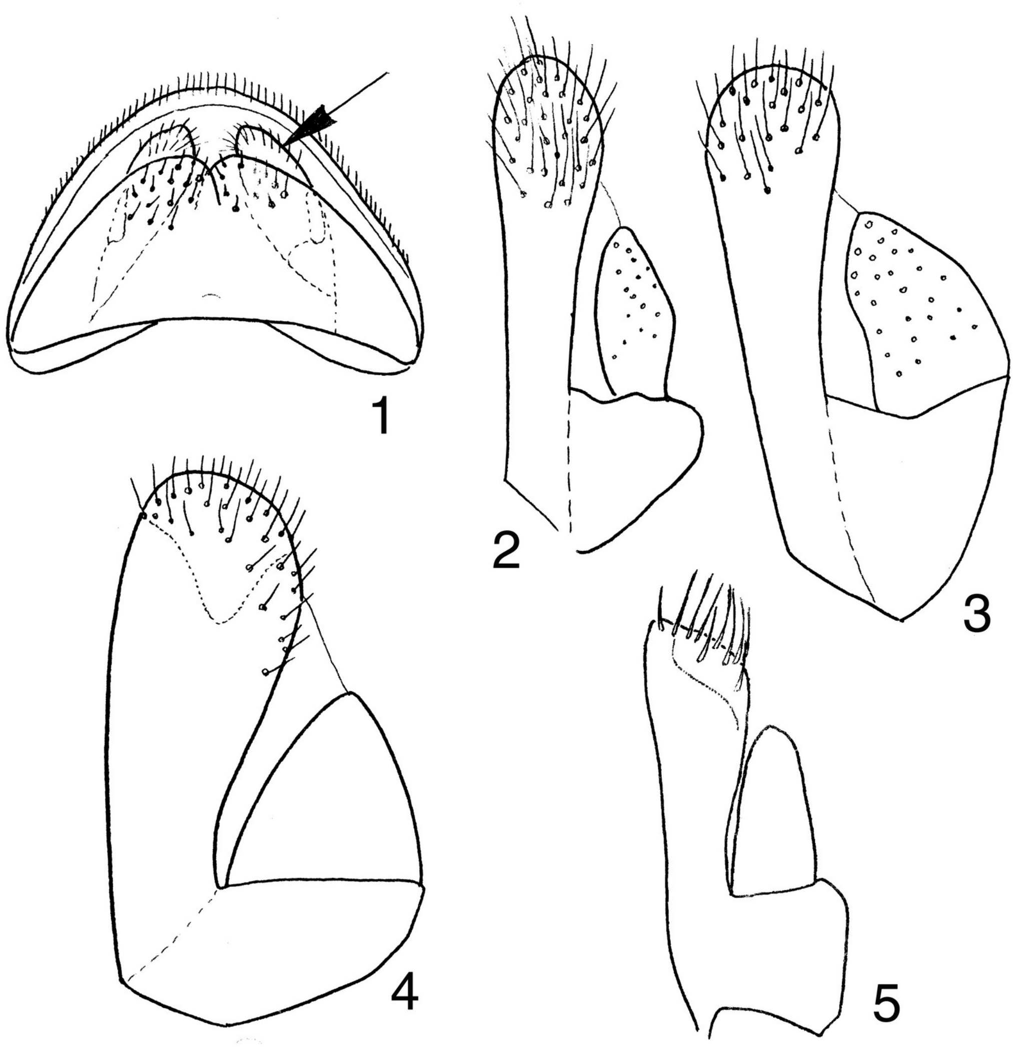
***Anopachys* figure 10:** *Chrysolina neglecta*: 1–3 – male, aedeagus: 1 – Khabarovsk Krai, 2 – paratype, Vladivostok, 3 – paratype, Khabarovsk Krai; 4–6 – male (holotype, Khabarovsk Krai): 4 – dorsal view, 5 – aedeagus, 6 – foretarsus; 7 – female (paratype, Khabarovsk Krai). a – dorsal view, b – lateral view, c – flagellum. (Orig.)



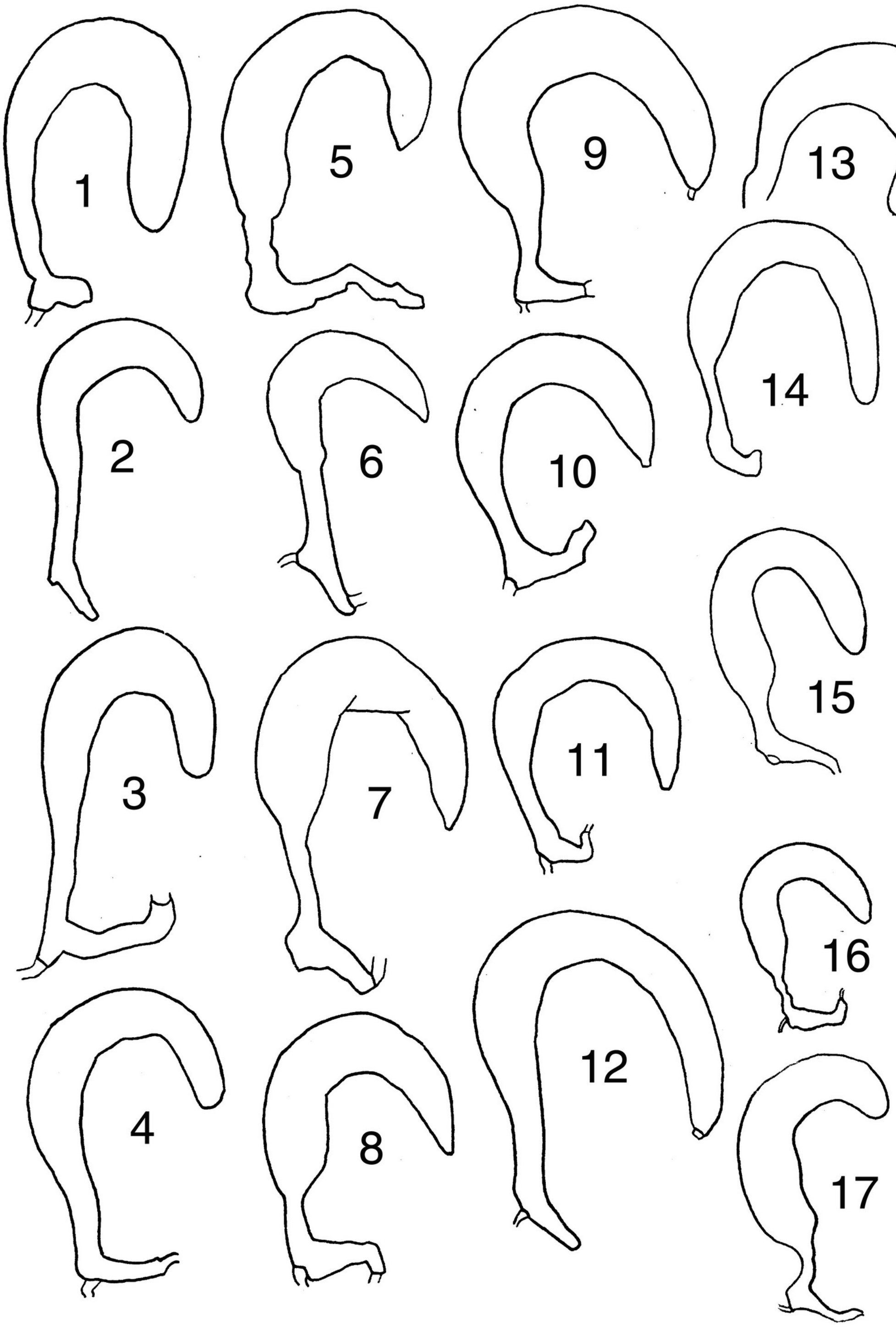
***Anopachys* figure 11:** *Chrysolina watanabei*: 1 – female (paratype, Hokkaido Isl.), pronotum; 2–7 – male aedeagus (a – dorsal view, b – lateral view, c – flagellum): 2 – topotype, Hokkaido, 3 – N-E China, 4 – Primorsky Krai, Laso Distr., 5 – Primorsky Krai, Suvorovo Vill., 6 – paratype, Hokkaido, 7 –Russia, Maritime prov. (paratype *Ch. sundukovi*). (Orig.)



Anopachys figure 12: Male aedeagus (a – dorsal view, b – lateral view, c – flagellum): 1 – *Chrysolina watanabei* (Primorsky Krai, Sikhote Alin Mts.), 2 – *Ch. pala* (Khabarovsk), 3 – *Ch. pala* (holotype, Primorsky Krai); 4 – *Ch. koreana* (Korea, Kangwon Prov.). (Orig.)

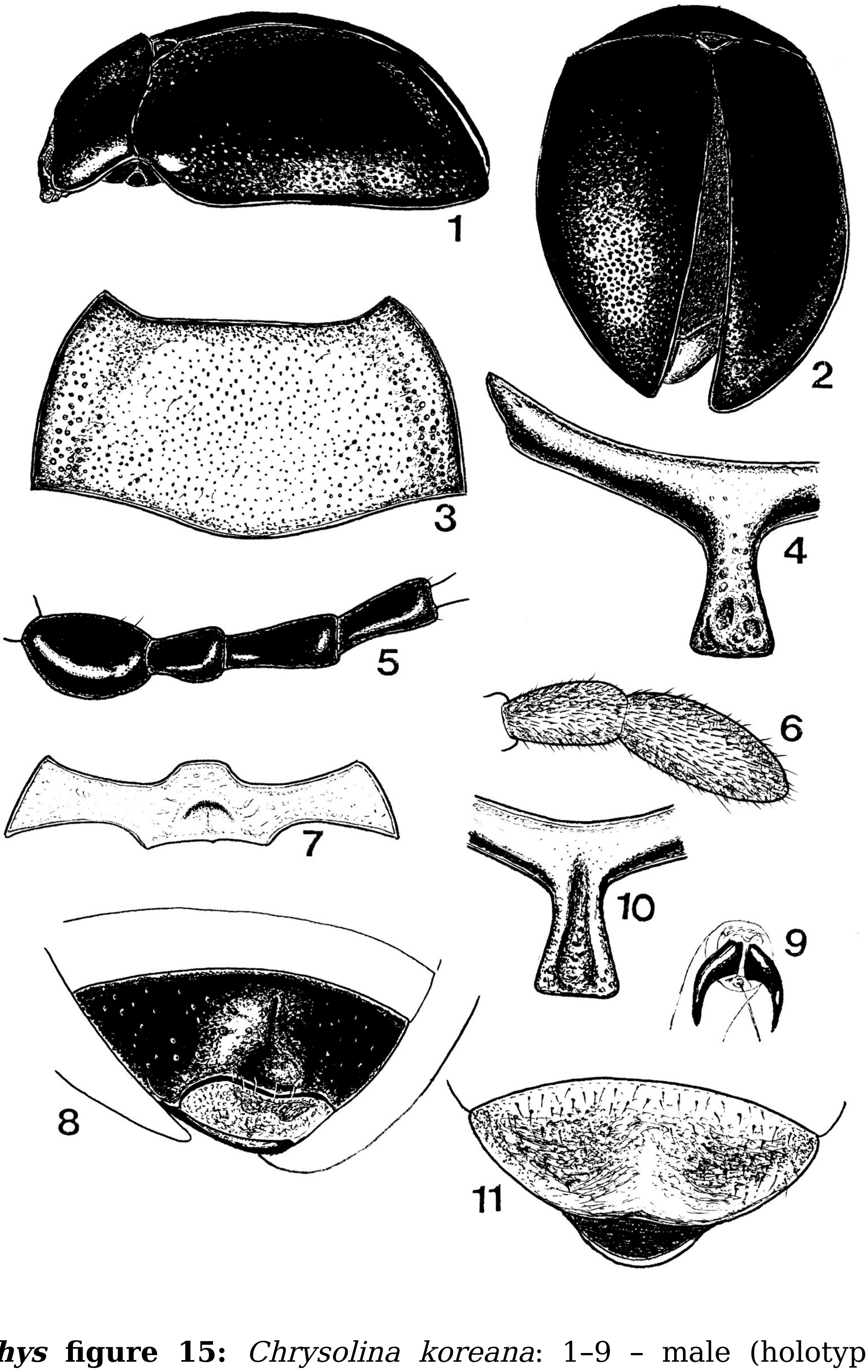


Anopachys **figure 13:** Female genitalia: 1–2 – *Chrysolina neglecta* (paratype, Khabarovsk Krai): 1 – genital sclerites, arrow shows gonocoxa, 2 – gonocoxa; 3–5 – gonocoxa: 3 – *Ch. lineigera* (Far East, Sikhote Alin Mts.), 4 – *Ch. lineella* (Far East, Primorsky Krai), 5 – *Ch. watanabei* (Hokkaido). (Orig.)



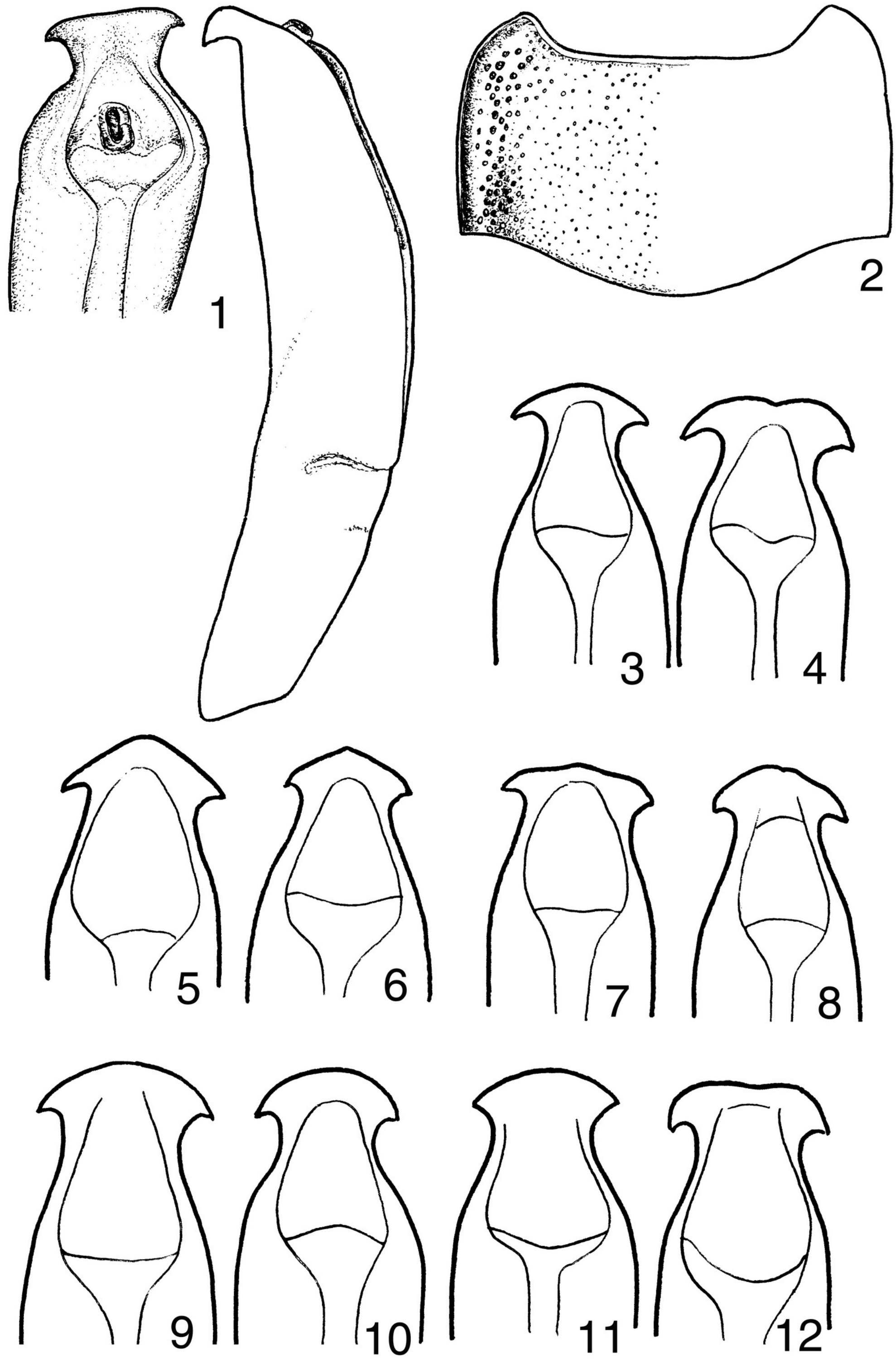
***Anopachys* figure 14:** Female spermatheca: 1–4 – *Chrysolina lineigera*: 1 – paralectotype, Transbaikalia, 2 – Amur valley, 3 – Khabarovsk Krai, 4 – Sikhote Alin Mts.; 5–8 – *Ch. neglecta*: 5 – paratype, Primorsky Krai, 6 – Khabarovsk Krai, 7 – Sikhote Alin Mts., 8 – Khabarovsk Krai; 9–12 – *Ch. lineella*: 9 – Primorsky Krai, 10 – Primorsky Krai, 11 – Khabarovsk Krai, 12 – Primorsky Krai; 13–17 – *Ch. watanabei*: 13 – Hokkaido Isl., 14 – Primorsky

Krai, Laso Distr., 15 – paratype, Hokkaido Isl., 16 – Sikhote Alin Mts., 17 – Primorsky Krai. (Orig.)



***Anopachys* figure 15:** *Chrysolina koreana*: 1–9 – male (holotype, Korea: Konro-Hô,): 1 – lateral view, 2 – elytra, posterior view, 3 – pronotum, 4 – prosternum, 5 – 1st–4th antennomeres, 6 – 10th–11th antennomeres, 7 – metasternum, 8 – last abdominal sternite, 9 – claws of fore-tarsus; 10–11 –

female, paratype (Korea: Konro-Hô): 10 – prosternum, 11 – last abdominal sternite. (Orig.)



***Anopachys* figure 16:** *Chrysolina aurichalcea*: 1–2 – male (syntype *Ch. lobicollis*, N China): 1 – aedeagus, dorsal and lateral view, 2 – pronotum; 3–12 – intrapopulation variability of aedeagus, dorsal view: 3–4 – males from Mongolia (Eastern Aimak: envir. Choibalsany), 5–8 – males from Siberia

(Altai: Ongudaj), 9–12 – males from the Far East (Kurile Isls.: Kunashiri Isl.). (Orig.)

Subgenus *Apterosoma* Motschulsky, 1860b

Diagnosis

Dorsum shining or sericeous; dark metallic, unicolorous or pronotum and elytra differently colored. Underside and legs dark metallic.

Last maxillary palpomere elongate, oval, obliquely truncate at apex, similar to penultimate one in length and width, not differ in both sexes. Antenna inserted 1.6–2.7X closer to clypeus than to eye.

Pronotum cordiform, broadest anteriorly to mid-length, swollen laterally at entire length, with lateral impressions wide, shallow in basal ⅔ or ¾, shallow to obsolete anteriorly (Fig. 2). Pronotum covered by coarse dense mostly irregular punctures. Anterior side marginated, without setae. Anterior setiferous pore absent. Pronotum laterally moderately or weakly swollen along entire length. Lateral impressions very shallow and wide along entire length, or obsolete anteriorly, filled with large, numerous punctures.

Prothoracic hypomeron convex or flat, more or less impressed and transversely rugose along outer margin. Basal fold weak or distinct.

Metasternum entirely marginated anteriorly.

Elytron without humeral callus, covered by coarse dense mostly irregular punctures (Fig. 2).

Elytral epipleura inclined outside, visible at entire length in lateral view, with sparse setae apically.

Hind wings vestigial.

Tarsomeres 1–3 entirely pubescent beneath in both sexes. In male tarsomere 1 as broad as 3 and broader than respective tarsomere in female. Claw tarsomere without denticles beneath.

Pygidium with wide shallow groove in basal ½, rarely with distinct groove along almost entire length. In male pygidium and last abdominal sternite evenly convex. In female last abdominal sternite stretched and laterally squeezed forming "ovipositor", pygidium triangularly stretched at apex, covering the base of "ovipositor" (Fig. 5).

Aedeagus long, narrow, oval in cross-section, moderately curved, with narrow apical projection, slightly curved dorsally (Figs. 1, 6–8).

Differential diagnosis

Apterosoma

This subgenus is easily distinguished from the other Asian subgenera by the female pygidium and last abdominal sternite elongate, modified into "ovipositor" (Fig. 5), and by the combination of the cordiform pronotum and dense, coarse, mostly irregular puncturation on pronotum and elytra. Males externally resemble wingless members of the subgenus *Anopachys* (see "Differential diagnosis" of *Anopachys*).

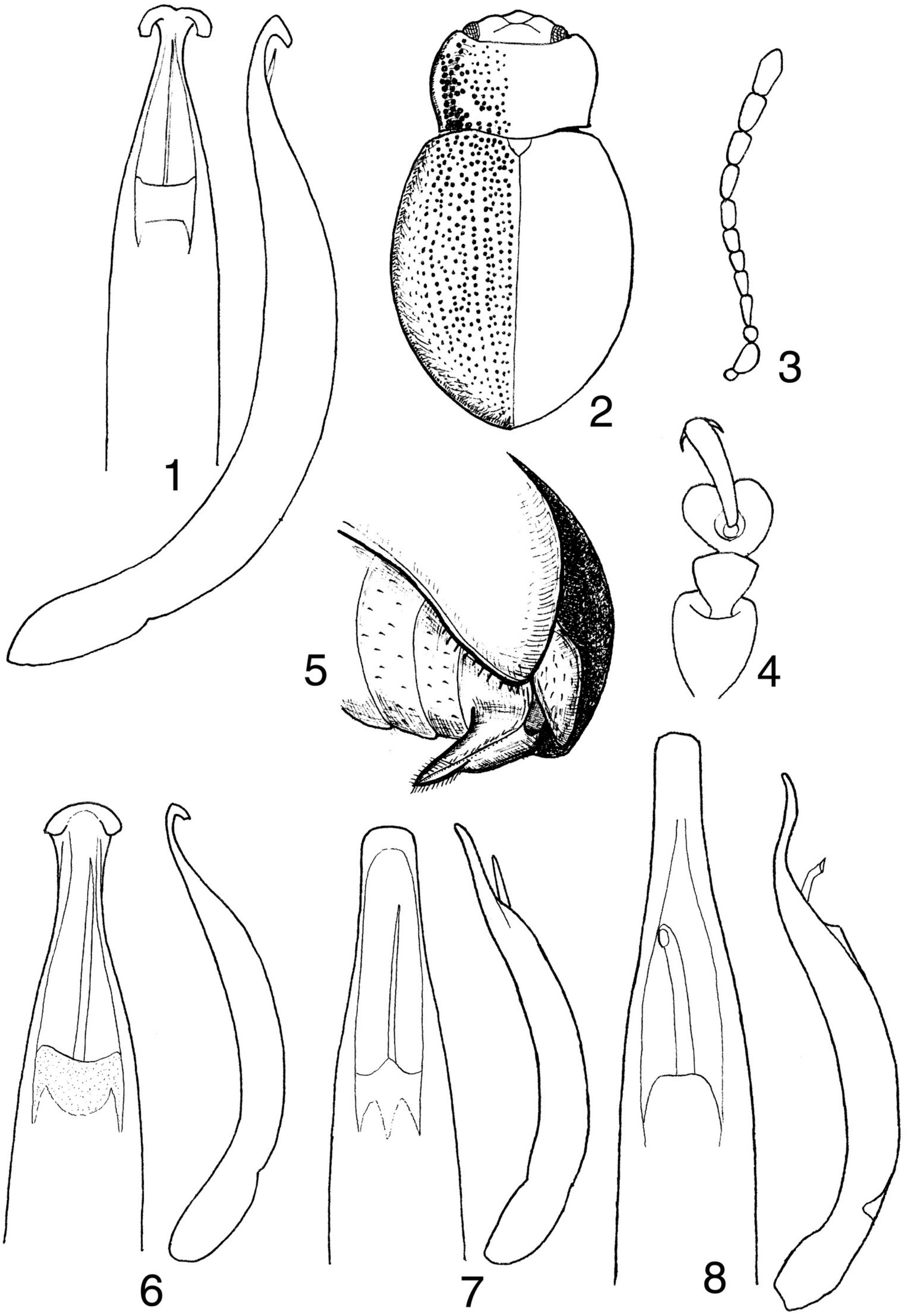
Key to species (Hasegawa (1980) revised this subgenus)

1(2) Mostly smaller, 6.3–8.0 mm long. Hind wings much reduced, 1.0–1.8 mm long. Aedeagus with apical projection anchor-shaped (Figs. 1, 6). Dorsum differently colored: 1) bluish black with elytra dark violet, 2) head and elytra bluish black, pronotum black, 3) entirely dark green with golden reflection, 4) as previous but pronotum (except lateral calli) coppery, 5) head and pronotum brassy, elytra coppery. Figs. 1–6. Kunashiri and Hokkaido Isls.
Ch. porosirensis Takizawa, 1970

2(1) Mostly larger, 7.5–10.0 mm long. Aedeagus with narrow apical projection, not anchor-shaped (Figs. 7, 8).

3(4) Hind wing longer, 2.3–5.8 mm long. Aedeagus usually longer, 2.7–4.8 mm long, with apical part usually thrice-curved in lateral view (Fig. 8). Dorsum differently colored: 1) entirely black with green reflection, 2) entirely greenish blue, 3) entirely violet, 4) pronotum and head greenish blue (sometimes with vertex violet), elytra violet, 5) pronotum and head violet, elytra bronze, 6) pronotum and head green, elytra blue. Length 7.5–8.7 mm (male), 8.8–9.5 mm (female). Far East, Japan, N-E, E China.
Ch. angusticollis (Motschulsky, 1860b)

4(3) Hind wings shorter, 1.0–2.4 mm long. Aedeagus usually shorter, 3.0–3.8 mm long, with apical part always straight in lateral view (Fig. 7). Body differently colored: 1) dark coppery (elytra sometimes with greenish reflection) with underside and legs bluish black, 2) body including legs bluish black with vertex and elytra violet, 3) head violet black with clypeus bluish black, pronotum violet-black, elytra brassy black. Length 8–10 mm. Japan, Korea.
Ch. aino Takizawa, 1970



***Apterosoma* figures 1–8:** 1–6 – *Chrysolina porosirensis*: 1–4 – male (Hokkaido): 1 – aedeagus, dorsal and lateral view, 2 – dorsal general view, 3 – antenna, 4 – fore-tarsus; 5 – female (paratype, Hokkaido: Porosiri Mt.), apex of abdomen with ovipositor; 6 – male (Kunashiri Isl.), aedeagus, dorsal and lateral view; 7–8 – aedeagus, dorsal and lateral view: 7 – *Ch. aino* (Hokkaido Isl.), 8 – *Ch. angusticollis* (Hokkaido Isl.). (Orig.)

Subgenus *Arctolina* Kontkanen, 1959

Diagnosis

Body dark metallic or black; legs dark metallic, or black, or partially or completely brown or rufous.

Last maxillary palpomere not differ in both sexes or slightly broader in male than in female.

Pronotum swollen laterally along entire length, lateral callus separated from disc by impression at least in basal ½. Anterior setiferous pores absent. Anterior side of pronotum marginated and ciliate.

Prothoracic hypomeron weakly or rather convex, with shallow impression filled with wrinkles, or with neither wrinkles, nor impression along outside. Basal fold distinct in *Ch. ballioni, Ch. cyanella, Ch. dolini, Ch. kaikana, Ch. magniceps* (some specimens), *Ch. octocosta, Ch. oirota, Ch. saurica, Ch. subsulcata, Ch. tshingilica*, *Ch. valichanovi,* or weak in the others.

Metasternum entirely marginated anteriorly.

Elytron without humeral callus or with very weak callus; striato-punctate. Rows regular or 5–8th partly irregular (or 4–6th (2–7th in holotype) rows irregular in *Ch. tshingilica*), placed at equal distance from each other (in some specimens of *Ch. valichanovi* rows slightly paired). Intervals from flat to strongly elevated, similar in appearance or alternating intervals more elevated.

Epipleura visible at entire length in lateral view, sparsely or densely ciliate near apex.

Hind wings vestigial or absent.

Tarsi entirely pubescent below in both sexes, or female tarsomere 1 sparsely ciliate or with narrow glabrous stripe in basal ½. In male all tarsi or only fore- and mid-tarsi broadened, in female tarsi narrow. Claw tarsomere without denticles beneath.

Pygidium evenly convex (in *Ch. kryzhanovskii, Ch. tshingilica*), or with distinct longitudinal groove in basal ⅔ (in *Ch. magniceps*), or with weak longitudinal impression along entire length (in *Ch. borochorensis, Ch. cyanella, Ch. oirota, Ch. saurica, Ch. septentrionalis, Ch. tastavica*), or with weak impression in basal ¼–⅔ in the others.

Male last abdominal sternite more or less convex or swollen, mostly with narrow sulcus along apical margin; female last abdominal sternite more or less convex or swollen, with narrow apical sulcus or without it.

Aedeagus oval in cross-section or flattened, curved, with small but always distinct alae, flagellum invisible.

Differential diagnosis

Subgenus *Arctolina* is very close to subgenus *Pleurosticha* and differs in alae of aedeagus weakly developed, smaller than those in *Pleurosticha*.

The presence of alae of aedeagus provides a feature to distinguish *Arctolina* from the externally similar species, such as members of the subgenus *Pezocrosita*: *Ch. kozlovi* Lopatin, *Ch. obovata* (Jacobson), *Ch. przewalskii* (Jacobson), *Ch. dubeshkoae* L. Medvedev, and *Ch.* (*Semenowia*) *chalcea* (Weise).

Key to species

Species from different geographical regions are keyed separately:
A. Species from N Eurasia (including European Russia and Ural) and Alaska.
B. Species from E Kazakhstan, S Siberia, and N-W China.

A. Key to species from N Eurasia (including European Russia and Ural) and Alaska

1(4) Apex of aedeagus broadly truncate or rounded, but neither gradually attenuated, nor drawn off (Figs. 6: 1–12; 7: 1–8).

2(3) Dorsum strongly or moderately shining, unicolorous: bronze, green, blue, rarely black, or bicolorous: pronotum bronze (sometimes with lateral calli green), and elytra green; legs and ventral side colored as well as dorsal side. Pronotal impressions narrow, deep, furrow-shaped in basal ⅓–½, shallower or obsolete, without sharp outer border anteriorly. Elytral intervals moderately or slightly convex, rarely flat. Aedeagus usually more slender (in lateral view), weakly curved, with larger triangular alae (Figs. 6: 1–12; 7: 1). Body mostly smaller: male 4.8–5.8 mm long, female 4.8–6.4 mm long. Figs. 4: 15; 9: 4. Barents Sea, Polar Urals, Arctic Asia, Alaska.
Ch. septentrionalis (Ménétriés, 1851)

3(2) Dorsum weakly or moderately shining or dull, dark blue, greenish bronze, or bronze. Legs and ventral side black or brown with bronze reflection. Pronotal impressions narrow, deep, furrow-shaped in basal ½–⅔, moderately deep or shallow, but always with distinct outer border anteriorly. Elytral intervals flat or slightly convex. Aedeagus usually thicker (in lateral view), more strongly curved in apical ½, with smaller alae (Fig. 7: 2–8); shape variable: 1) more robust and shorter, with apex evenly curved in lateral view and slightly narrowed at sides of apical orifice in dorsal view (Fig. 7: 5–8), or 2) more slender and longer, with apex slightly S-shaped in lateral view and more narrowed at sides of apical orifice in dorsal view (Fig. 7: 2, 4), or 3) intermediate form between "1" and "2" (Fig. 7: 3). Body mostly larger: male 5.4–5.9 mm long, female 5.7–7.0 mm long. European Russia (north, middle belt (Lipetsk reg.), Urals), north of W Siberia, E Siberia. Species includes two subspecies.

Ch. poretzkyi (Jacobson, 1897)

4(1) Aedeagus with triangular apical projection of various shapes.

5(6) Aedeagus with apical projection narrow, elongate, recurved before apex in lateral view (Fig. 9: 2). Pronotal sulci broad, strongly impressed posteriorly, shallower anteriorly. Elytral intervals 2–9 evenly elevated into ridges, interval 10 convex in anterior ½, ridge-shaped in posterior ½. Dorsum black, wholly moderately shining in male, with sericeous elytra in female. Legs rufous. Length 5.3–7.0 mm (male), 5.7–7.4 mm (female). Figs. 4: 16; 9: 8. Arctic Asia.

Ch. bungei (Jacobson, 1910b)

6(5) Aedeagus blunt at apex, with short apical projection. Dorsum moderately shining in both sexes.

7(10) Aedeagus more or less distinctly recurved before apex (in lateral view) (Figs. 8: 6–9; 9: 1).

8(9) Apex of aedeagus broadly rounded and then triangularly drawn off (Fig. 9: 1). Pronotal sulci broad, shallow or moderately deep in basal ⅓–½, almost obsolete anteriorly. Elytral intervals 2–8 moderately convex, interval 9 more convex, interval 10 concave. Dorsum bright green, dark green, or bronze, usually with pronotal and elytral lateral sides and head (partly) violet. Legs dark metallic or black. Male tarsomeres 1-3 very broad (Fig. 4: 12). Length 6.3–7.3 mm (male), 7.5–7.6 mm (female). Yakutia, Kamchatka, Okhotsk Sea shore.

Ch. boeberi (Harold in: Gemminger, Harold, 1874)

9(8) Apex of aedeagus gradually attenuated into blunt point (Fig. 8: 6–9). Pronotal sulci narrow and deep in basal ⅓, shallower anteriorly. Elytral intervals 3, 5, 7, and 9 strongly elevated forming ridges, 2 and 4 slightly elevated or flat, 6 and 8 flat, or intervals 2–9 evenly convex, interval 10 flat or weakly convex. Dorsum black, blackish green, bluish green, or green. Femora and tibiae dark metallic, tarsi brown, or legs entirely rufous or brown. Length 5.6–7.0 mm (male), 5.6–7.2 mm (female). Figs. 4: 14; 9: 9. Arctic Asia, Isls. of Bering Sea and Strait, Alaska.

Ch. magniceps (J.Sahlberg, 1887)

10(7) Aedeagus evenly curved (in lateral view), with apex attenuated into blunt point (Fig. 8: 1–5). Pronotal sulci narrow, deep in basal ⅓, shallower anteriorly. Elytral intervals 2–9 evenly convex, or 3, 5, 7 (rarely also 9) more elevated than 2 and 4, 6 and 8 flat or weakly convex, interval 10 convex. Dorsum greenish bronze, bluish green, or black with greenish tinge or without it. Legs dark metallic, brownish, or reddish. Length 5.7–8.2 mm (male), 5.9–7.4 mm (female). Figs. 4: 13; 9: 3, 10. Arctic Asia, Alaska.

Ch. subsulcata (Mannerheim, 1853)

B. Key to species from E Kazakhstan, S Siberia, and N-W China

1(4) Pronotal impressions shallow or indistinct, not forming, deep sulci basally (Fig. 5: 1, 2).

2(3) Dorsum entirely bronze or coppery, or bicolorous: head bronze with vertex coppery, pronotum bronze, elytra coppery. Elytral intervals weakly convex or flat. Length 5.0–6.0 mm (male), 6.1–6.7 mm (female). Fig. 5: 8–12. China (Xinjiang).

Ch. borochorensis Lopatin, 2000a

3(2) Dorsum bicolorous: head, pronotum, and scutellum dark coppery with purple reflection or violet, elytra green or bluish green. Elytral intervals from flat to moderately convex. Length 6.1 mm (male), 6.1–6.7 mm (female). Fig. 5: 1–7. China (Xinjiang).

Ch. boreosinica Lopatin, 2004

4(1) Pronotal impressions distinct, forming narrow, deep sulci basally (as in Figs. 1: 2, 10; 2: 1, 2; 4: 3, 9–11). Pronotal disc with dense, distinct punctures.

5(6) Pronotum laterally broadly swollen, with lateral sides strongly arc-shaped. Body larger, length 7.2–8.6 mm (male), 7.7–9.4 mm (female). Aedeagus as in Fig. 3: 6. Dorsum violet, wholly moderately shining or with elytra sericeous. Femora and tibiae black with metallic tinge, tarsi piceous or black. Figs. 4: 10–11; 9: 5. Altai.

Ch. cyanella (Gebler, 1830)

6(5) Pronotum laterally narrowly swollen, with lateral sides weakly or strongly arc-shaped. Body smaller, length 5.4–6.5 mm (male), 5.7–7.5 mm (female). In species belonging to this group, coloration, shape of pronotum and elytral intervals variable. Examination of male aedeagus is necessary for the precise identification.

7(10) Aedeagus with long, very narrow apical projection which broadened at apex (Figs. 1: 6; 3: 4).

8(9) Pronotal lateral sides rounded. Aedeagus as in fig. 3: 4. Dorsum sericeous shining in both sexes, or moderately shining in male; violet. Underside and legs blackish brown with bronze reflection. Length 6.3–6.5 mm (male), 7.0 mm (female). Fig. 9: 7. N-E, S-E Kazakhstan.

Ch. ballioni (Lopatin, 1968a)

9(8) Pronotal lateral sides weakly rounded in anterior ½, almost rectilinear in posterior ½. Aedeagus as in Fig. 1: 6. Dorsum moderately shining (male), moderately shining with elytra sericeous (female), dark bronze with golden reflection, head and pronotum with weak violet reflection (male) or head and pronotum violet (female), scutellum dark blue. Underside and legs blackish brown. Length 5.8 mm (male), 7.0 mm (female). Fig. 1: 1–10. S-E Kazakhstan.

Ch. dolini Lopatin, 1999

10(7) Aedeagus apically different, always without long, very narrow apical projection.

11(22) Aedeagus with apex broad: triangular, rounded, or truncate.

12(15) Aedeagus apically varies in shape (Figs. 5: 8–12; 10: 1), but always distinctly curved downwards (see laterally).

13(14) Male tarsomeres 1–3 very broadened. Elytral puncture rows regular. Dorsum entirely sericeous shining, or moderately shining with only elytra sericeous (female), or entirely moderately shining (male). Body dark metallic: entirely bronze or coppery, or bicolorous: head bronze with vertex coppery, pronotum bronze, elytra coppery. Legs piceous. Aedeagus as in Fig. 5: 8–12. Length 5.0–6.0 mm (male), 6.1–6.7 mm (female). China (Xinjiang: Tien-Shan).

Ch. borochorensis Lopatin, 2000a

14(13) Male tarsomeres 1–3 slightly broadened. Elytral puncture rows irregular, especially 4–6th or 2–7th ones. Dorsum shining, differently colored: 1) elytra green, pronotum and head green with violet or bronze reflex, 2) elytra violetish green, pronotum and head green with bronze reflex, 3) dorsum unicolor green with violet reflex, or golden green. Legs black, with (or without) feeble bronze reflex. Aedeagus as in Fig. 10: 1. Length 5.4–5.9 mm (male), 6.1–7.1 mm (female). China (Xinjiang: Altai).

Ch. tshingilica Mikhailov, 2021

15(12) Aedeagus not curved downwards apically (see laterally).

16(19) Aedeagus triangular apically (Figs. 2: 5; 3: 5).

17(18) Pronotal disc covered with distinct, dense punctures. Elytral intervals convex, ridge-shaped in both sexes, covered with fine, distinct, dense punctures. Dorsum moderately shining. Body black, pronotum and elytra with bluish reflection laterally. Legs blackish brown with metallic reflection. Aedeagus as in Fig. 3: 5. Length 5.9 mm (male). Altai.

Ch. oirota Lopatin, 1990b

18(17) Pronotal disc glabrous, covered with very fine, sparse punctures. Elytral intervals very weakly convex, sparsely and very finely punctate. Dorsum: male: black with strong golden greenish reflection, head and pronotum shining, elytra moderately shining; female: head and pronotum black with strong golden greenish reflection, shining, elytra black with strong golden reflection. Tibiae, femora, and underside black, tarsi piceous. Length 7.0 mm (male), 7.5 mm (female). Fig. 2. Kazakhstan (Dzhungar Alatau).

Ch. kaikana Lopatin, 1992b

19(16) Aedeagus truncate apically (Figs. 3: 1; 7: 3).

20(21) Aedeagus narrow: 3.3 X longer than wide at mid-length (Fig. 3: 1). Species from Dzhungar Alatau. Dorsum entirely moderately shining (male) or with elytra dull (female), bluish black. Underside and legs black. Length 5.5 mm (male), 6.6 mm (female).

Ch. kryzhanovskii (Lopatin, 1968a)

21(20) Aedeagus broad: 2.1–2.2 X longer than wide at mid-length (Fig. 7: 3). Species from Irkutsk reg. and Krasnoyarsk Krai. Dorsum weakly or moderately shining or dull, greenish bronze. Legs and ventral side black with bronze reflection. Length 5.4–5.9 mm (male), 5.7–7.0 mm (female).

Ch. poretzkyi (Jacobson, 1897)

22(11) Aedeagus strongly narrowed at sides of apical orifice, with apical projection short, more than 2 X narrower than aedeagus before apical orifice (Figs. 3: 2, 3, 7; 4: 5).

23(24) Alae of aedeagus projecting over lateral sides of apical orifice (in dorsal view) (Fig. 3: 7). Dorsum moderately shining (male) or sericeous shining (female), entirely dark green, greenish black, or posterior ⅔ of elytra violet. Legs black. Length 5.6–6.4 mm (male), 6.7–7.0 mm (female). Fig. 9: 6. E Kazakhstan.

Ch. saurica (Jacobson, 1924)

24(23) Alae of aedeagus not projecting over lateral sides of apical orifice (in dorsal view).

25(26) Femora and tibiae brown, antennae and tarsi rufous. Aedeagus as in Fig. 3: 3. Dorsum in male sericeous, in female pronotum moderately shining and elytra sericeous; black with bronze reflection. Underside dark brown with bronze reflection. Length 6.2 mm (male), 7.0 mm (female). Kazakhstan (Dzhungar Alatau).

Ch. valichanovi Lopatin, 1990b

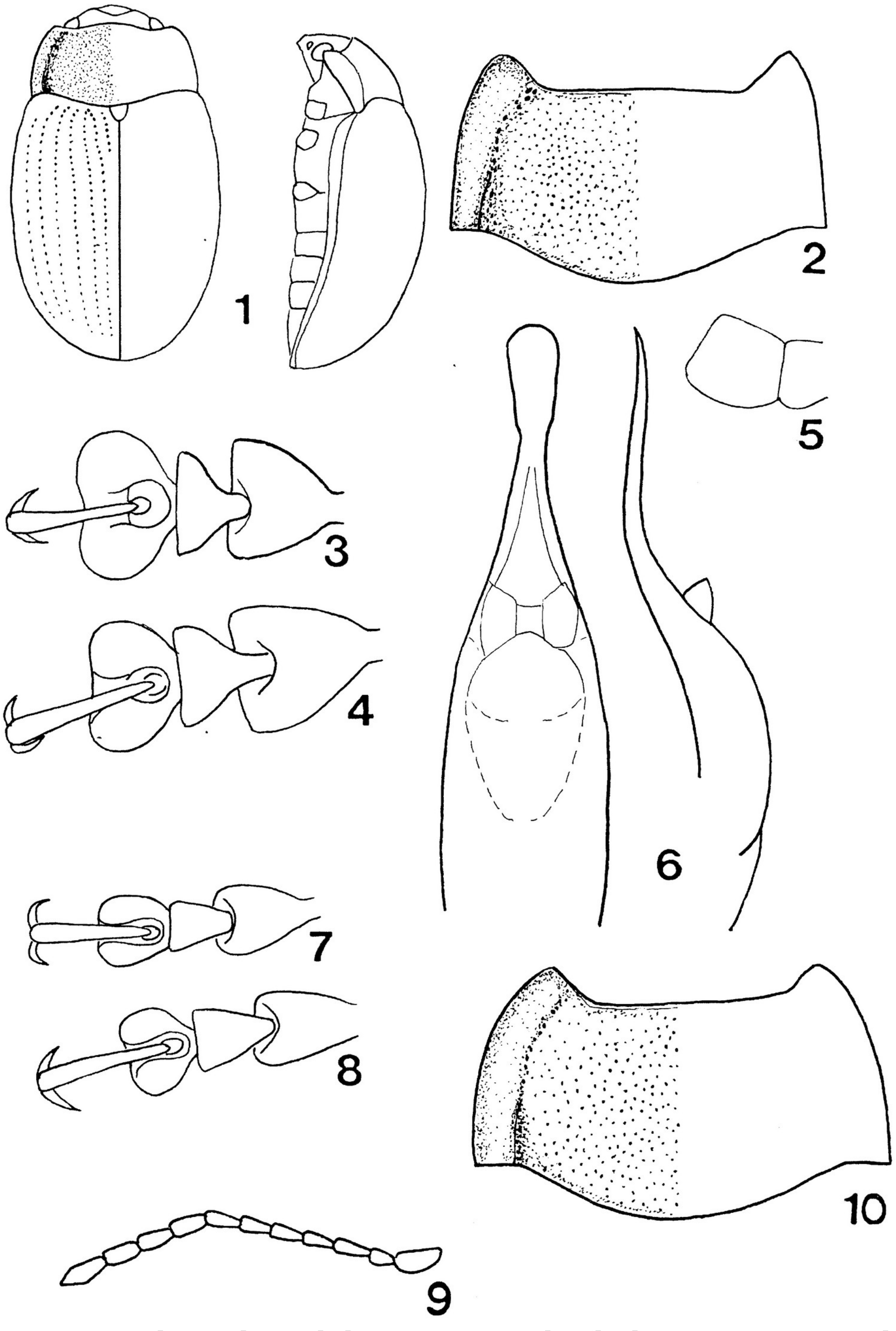
26(25) Femora and tibiae black, antennae and tarsi dark brown.

27(28) Aedeagus strongly curved downwards at apex (in lateral view) (Fig. 4: 5). Elytron with all intervals or only intervals 3, 5, 7, and 9 ridge-shaped. Dorsum shining, in female with sericeous elytra; black, dark bronze, or coopery-violet. Length 6.1 mm (male), 6.6 mm (female). Fig. 4: 1–9. Kazakhstan (Dzhungar Alatau).

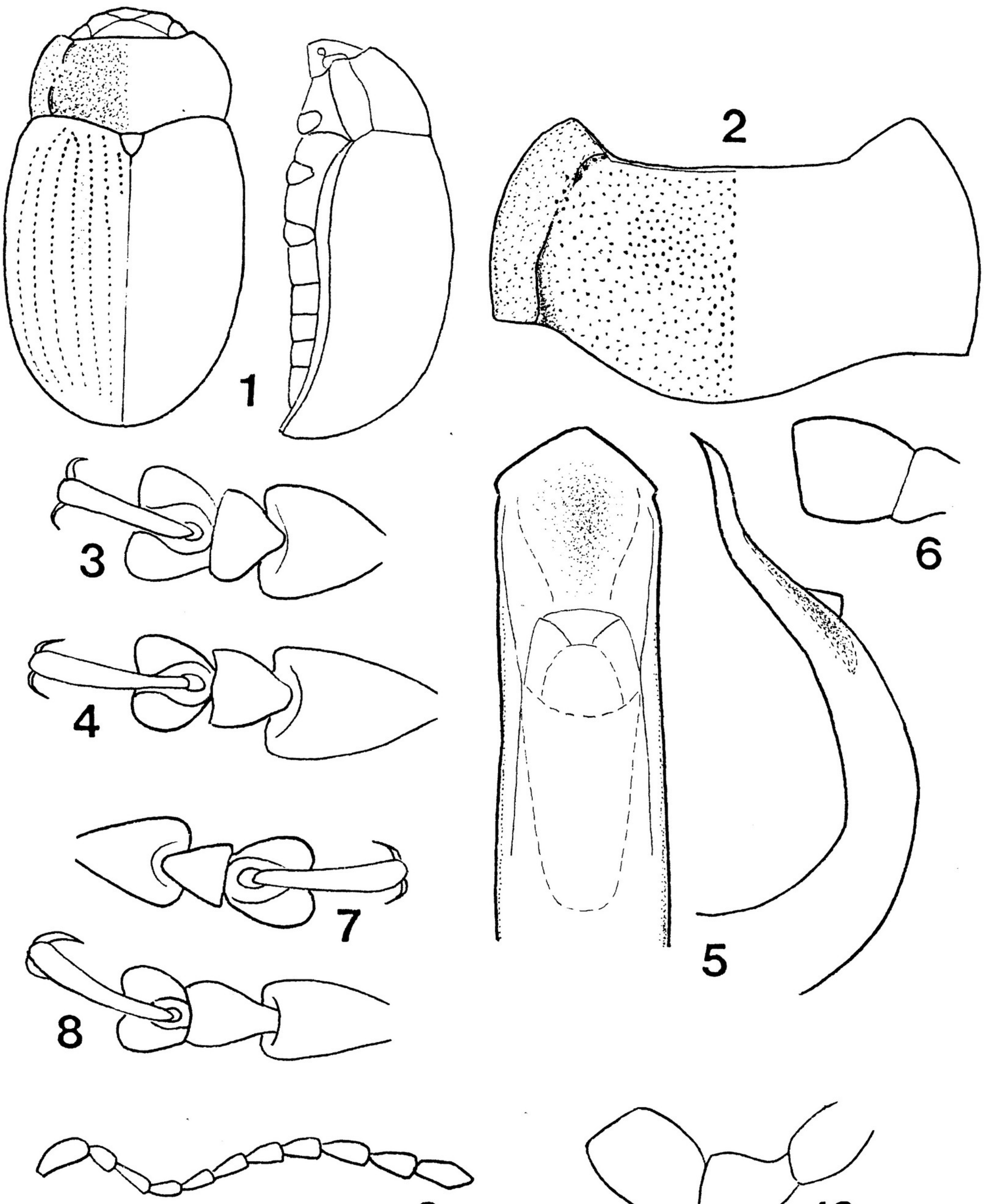
Ch. octocosta (Jacobson, 1924)

28(27) Aedeagus weakly curved upwards at apex (in lateral view) (Fig. 3: 2). Elytral intervals weakly convex (in female several intervals ridge-shaped on apical slope). Dorsum sericeous shining in both sexes, violet or bluish violet. Length 6.3 mm (male), 7.4 mm (female). Kazakhstan (Dzhungar Alatau)

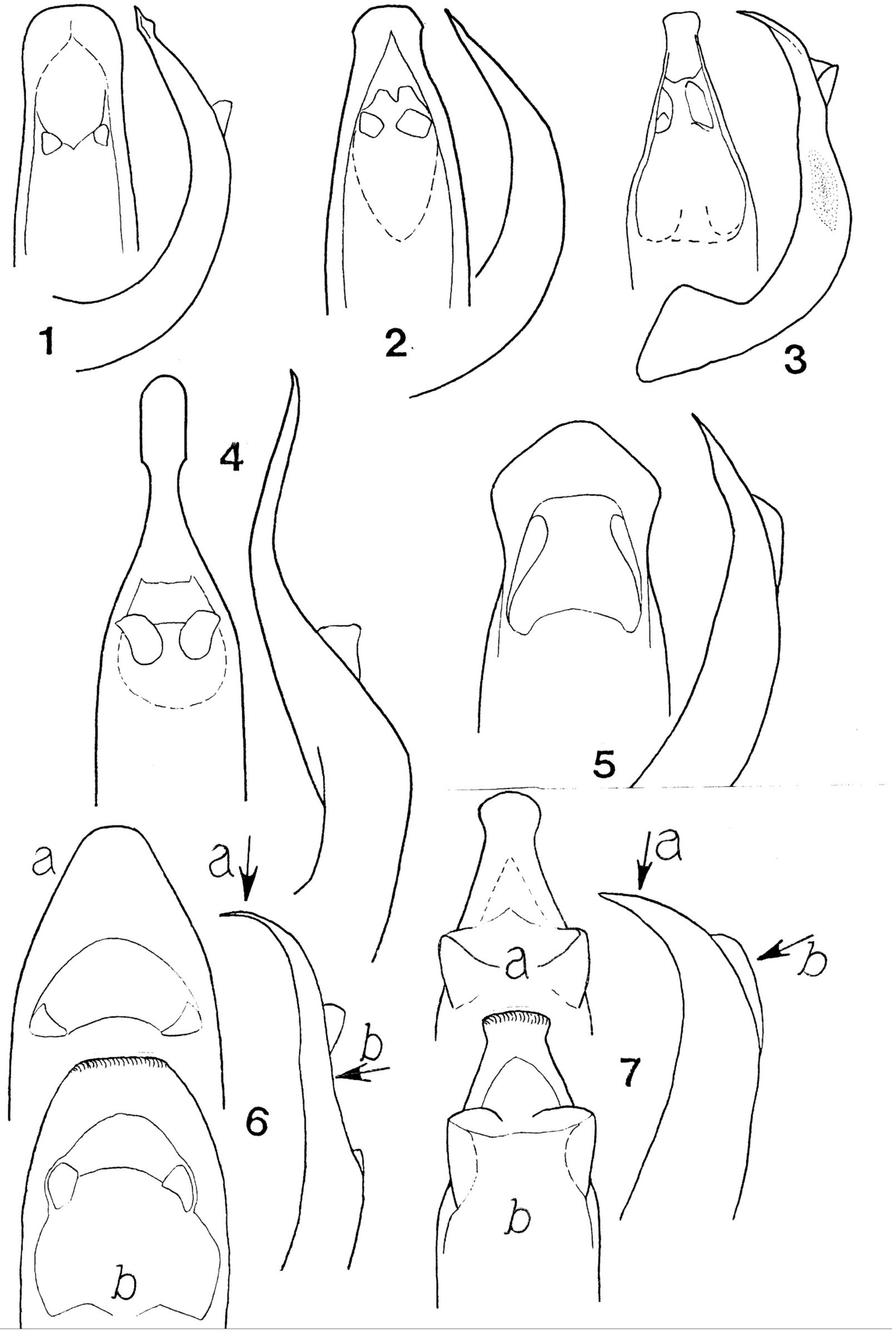
Ch. tastavica Lopatin, 1992b



Arctolina **figure 1:** *Chrysolina dolini*: 1–6 – male (holotype, S-E Kazakhstan: Dzhungar Alatau): 1 – dorsal and lateral view, 2 – pronotum, 3 – fore-tarsus, 4 – hind-tarsus, 5 – maxillary palpus, 6 – aedeagus, dorsal and lateral view; 7–10 – female (paratype, S-E Kazakhstan: Dzhungar Alatau): 7 – fore-tarsus, 8 – hind-tarsus, 9 – antenna, 10 – pronotum. (Orig.)

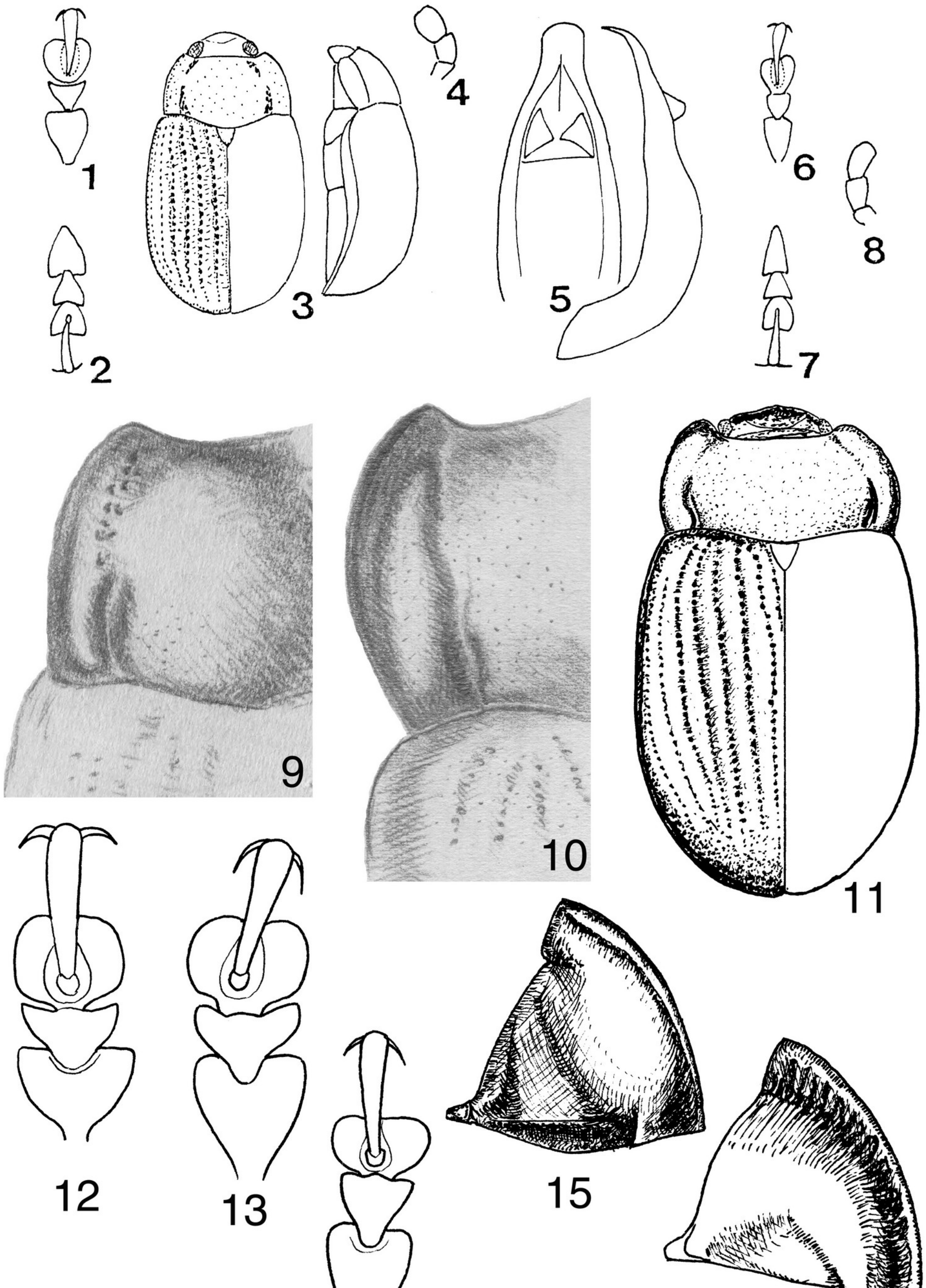


***Arctolina* figure 2:** *Chrysolina* (*Arctolina) kaikana*: 1–6 – male (holotype, S-E Kazakhstan: Dzhungar Alatau): 1 – dorsal and lateral view, 2 – pronotum, 3 – fore-tarsus, 4 – hind-tarsus, 5 – aedeagus, dorsal and lateral view, 6 – maxillary palpus; 7–10 – female (paratype, S-E Kazakhstan: Dzhungar Alatau): 7 – fore-tarsus, 8 – hind-tarsus, 9 – antenna, 10 – maxillary palpus. (Orig.)



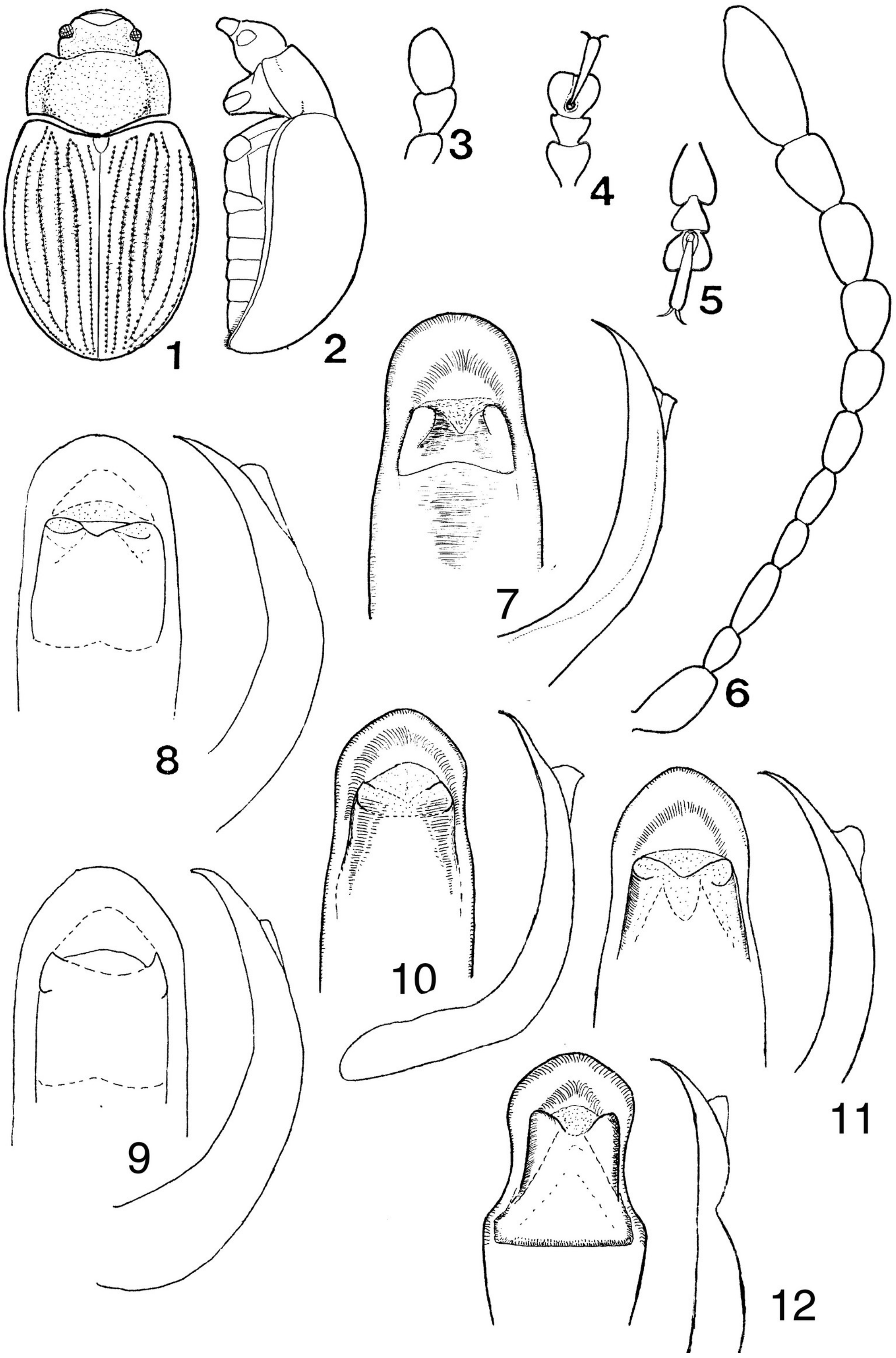
***Arctolina* figure 3:** Aedeagus, dorsal and lateral view: 1 – *Chrysolina kryzhanovskii* (S-E Kazakhstan: Dzhungar Alatau), 2 – *Ch. tastavica* (S-E Kazakhstan: Dzhungar Alatau), 3 – *Ch. valichanovi* (S-E Kazakhstan), 4 – *Ch.*

ballioni ("Ala-Tau"), 5 – *Ch. oirota* (holotype, Altai), 6 – *Ch. cyanella* (Altai), 7 – *Ch. saurica* (lectotype, E Kazakhstan). (Orig.)



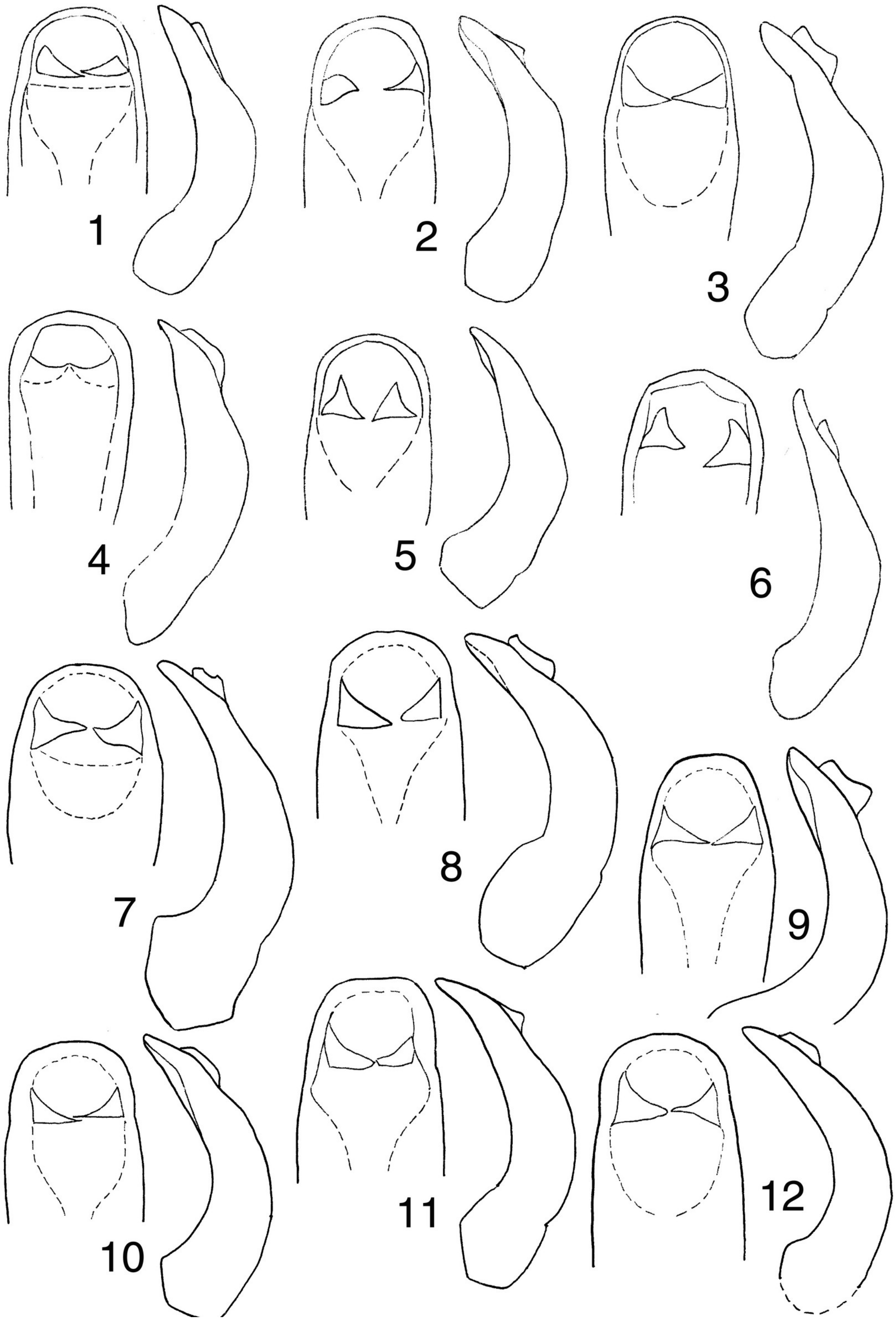
***Arctolina* figure 4:** 1–9 – *Chrysolina octocosta*: 1–5 – male (Kazakhstan: Sarkand): 1 – fore-tarsus, 2 – hind-tarsus, 3 – dorsal and lateral view, 4 – maxillary palpus, 5 – aedeagus, dorsal and lateral view; 6–8 – female (Kazakhstan: Sarkand): 6 – fore-tarsus, 7 – hind-tarsus, 8 – maxillary palpus; 9 – pronotum. 10–11 – *Ch. cyanella*: 10 – pronotum, 11 – male (Altai), dorsal view. 12–14 – males, fore-tarsus: 12 – *Ch. boeberi* (Magadan reg.), 13 – *Ch. subsulcata* (St. Paul Isl.), 14 – *Ch. magniceps* (St. Paul Isl.). 15–16 – male, prothoracic hypomeron: 15 – *Ch. septentrionalis* (Olenyok Bay), 16 – *Ch.*

bungei (Taimyr Penins.). (Figs. by an unknown author: 9, 10; others – figs. by the author)



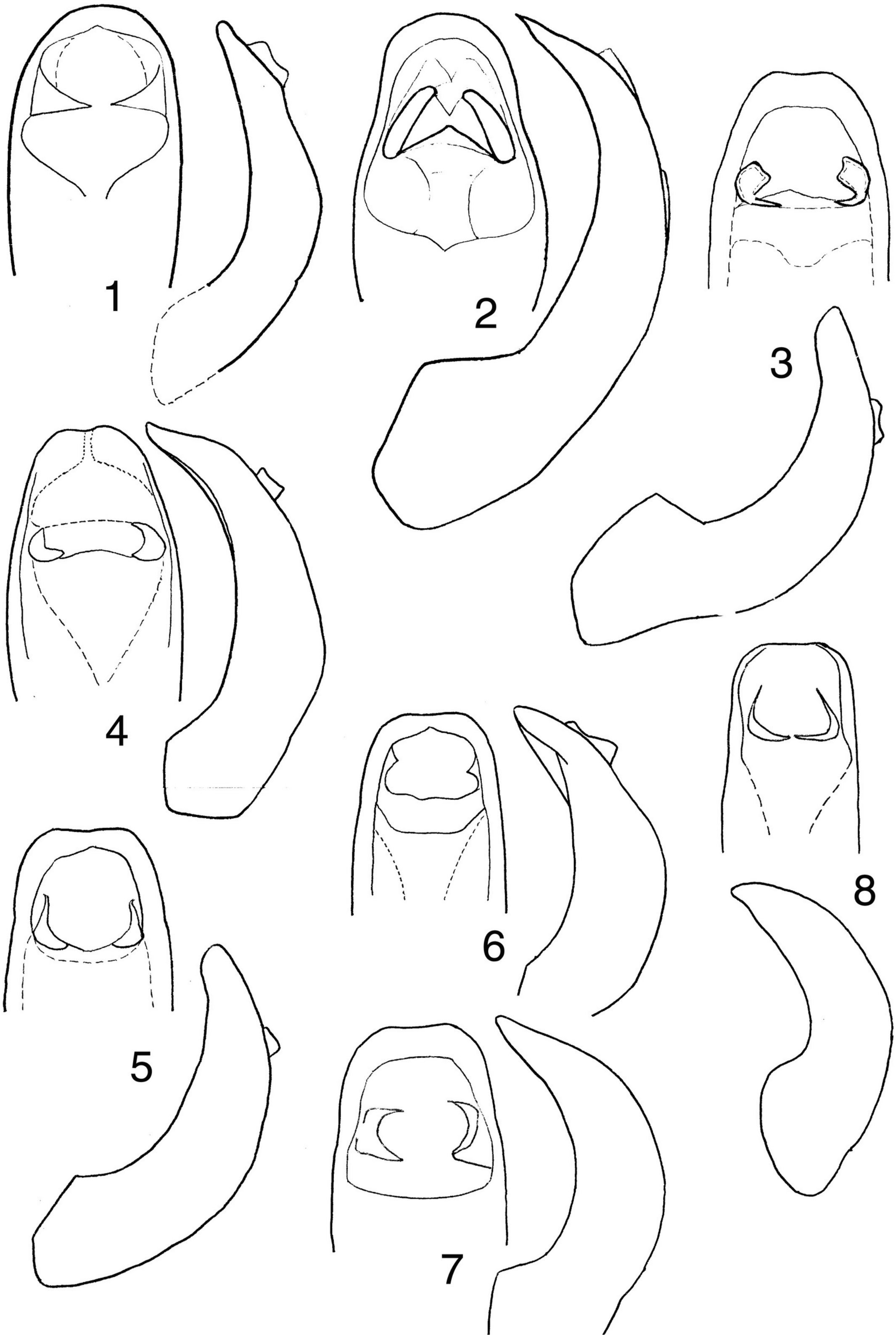
Arctolina **figure 5:** 1–7 – *Chrysolina boreosinica*, male (holotype, China: Sinkiang): 1, 2 – dorsal and lateral view, 3 – maxillary palpus, 4 – fore-tarsus, 5 – hind-tarsus, 6 – antenna, 7 – aedeagus, dorsal and lateral view. 8–12 – *Ch. borochorensis*, aedeagus, dorsal and lateral view: 8 – male (*Ch. naratica*, holotype, China: Xinjiang), 9 – male (paratype, China: Xinjiang), 10–12 –

variability of aedeagus in males from the same locality (China: Xinjiang, S slope of Narat ridge, Bayantal riverhead). (Orig.)



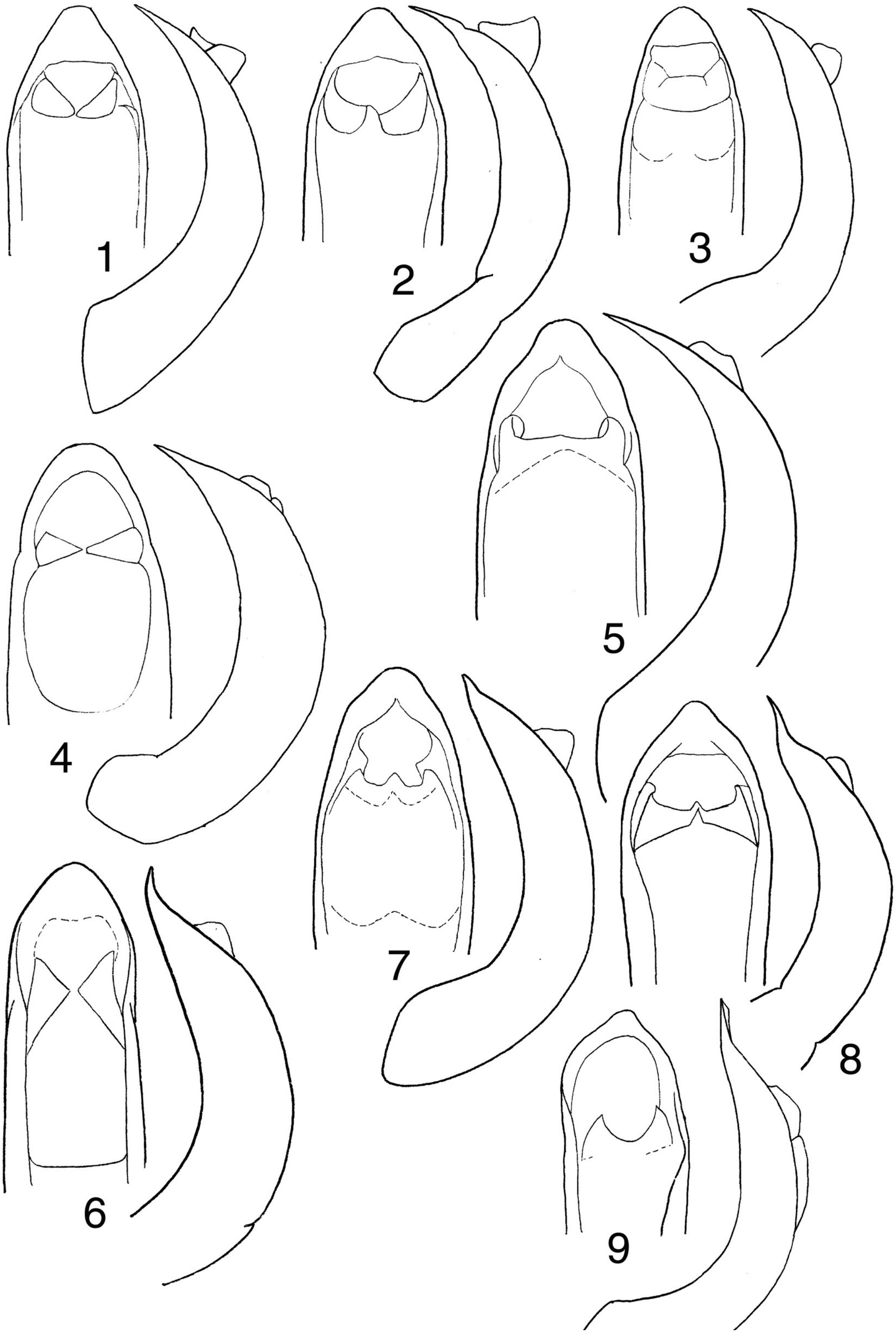
***Arctolina* figure 6:** *Chrysolina septentrionalis*, male, aedeagus, dorsal and lateral view: 1 – Laptev sea, Olenek bay, 2 – Severnaya Zemlya: Bolshevik Isl., 3 – Central Siberian Plateau, Putorana plateau, 4 – Novaya Zemlya (holotype), 5 – Taimyr Penins., 6 – Yakutia, 7–8 – Chukot Penins., 9 – N. Yakutia, Tiksi, 10

– N. Yakutia, Bykovsky Penins., 11 – Wrangel Isl., 12 – Yakutia, Yana river. (Orig.)



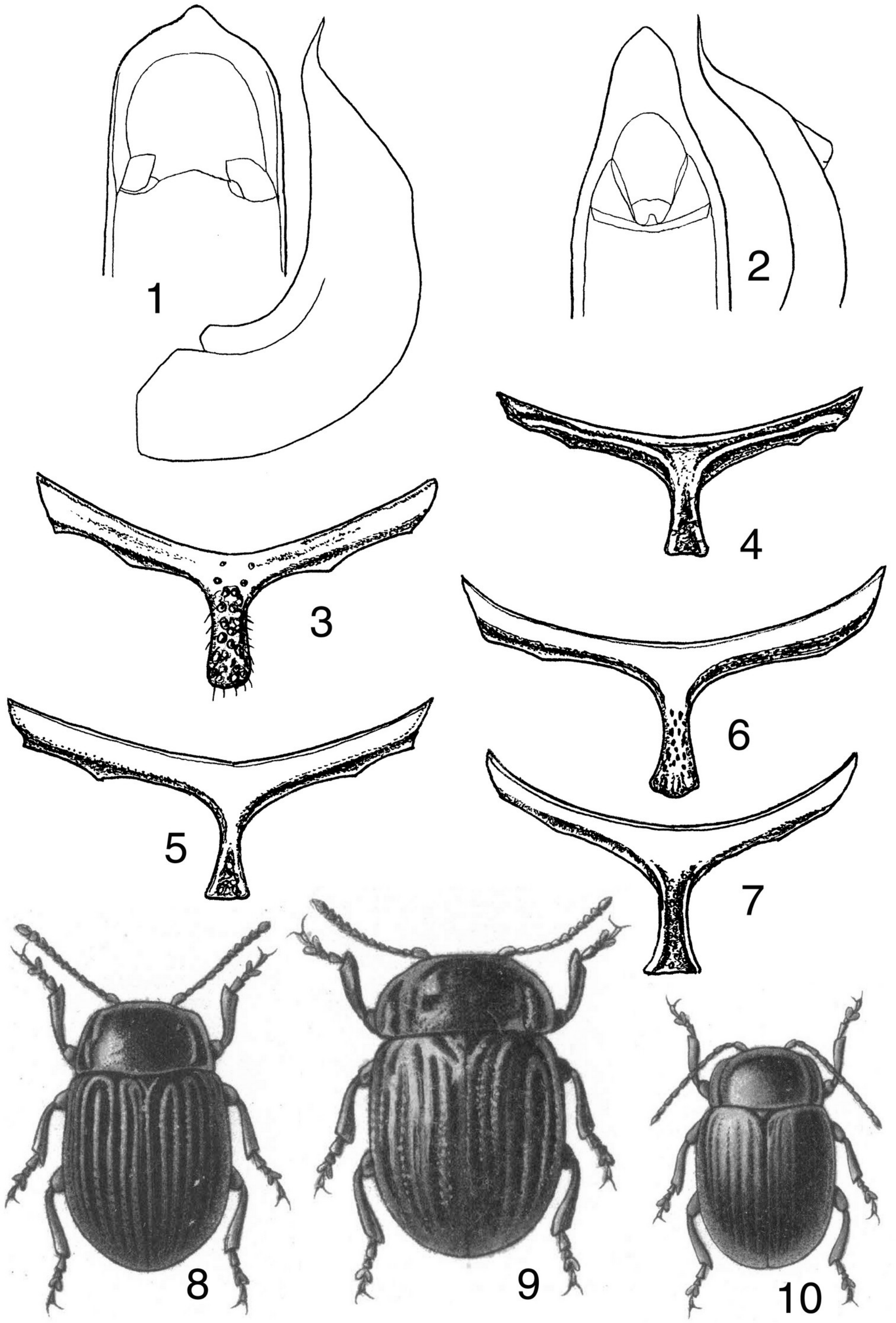
***Arctolina* figure 7:** Male, aedeagus, dorsal and lateral view: 1 – *Chrysolina septentrionalis* (paratype *Ch. caurina*, Alaska); 2–8 – *Ch. poretzkyi*: 2 – S Urals: Maly Iremel Mt., 3 – Irkutsk reg., 4 – Taimyr Penins., 5 – Komi

Republic, Bolshaya Synia river basin, 6 – Yenisei river, Dudinka Vill., 7 – European Russia, Lipetsk reg., 8 – Polar Ural. (Orig.)

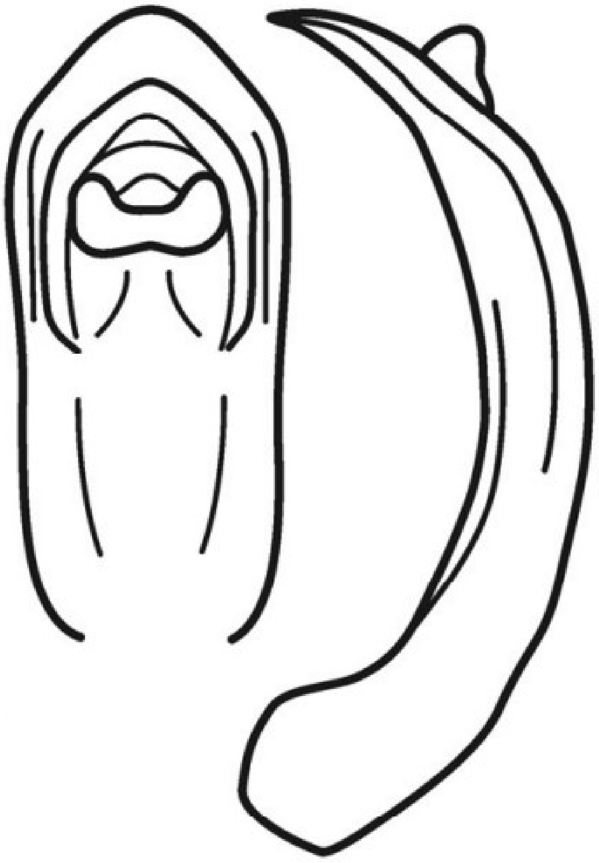


***Arctolina* figure 8:** Aedeagus, dorsal and lateral view: 1–5 – *Chrysolina subsulcata*: 1 – male (lectotype *Ch. birulai*, Faddejevskij Isl.), 2 – male (Yakutia), 3 – male (lectotype *Ch. birulai* var. *glacialis*, Liakhov Isl.), 4 – male (lectotype, St. Paul Isl.), 5 – male (St. George Isl.); 6–9 – *Ch. magniceps*: 6–7 – male (St. Paul Isl.), 8 – male (lectotype *Ch. birulai wollosowiczi*, Novaja Sibir

Isl.), 9 – male (lectotype *Ch. birulai novosibirica*, Novaja Sibir Isls., Lyakhov Isl.). (Orig.)



***Arctolina* figure 9:** 1–2 – aedeagus, dorsal and lateral view: 1 – *Chrysolina boeberi* (Sea of Okhotsk shore), 2 – *Ch. bungei* (Taimyr Penins.). 3–7 – prosternum: 3 – *Ch. subsulcata*, male (Wrangel Isl.), 4 – *Ch. septentrionalis*, male (Laptev Sea shore: Olenek Bay), 5 – *Ch. cyanella*, male (Altai), 6 – *Ch. saurica*, male, topotype (Tien Shan: Saur ridge), 7 – *Ch. ballioni*, male (S-E Kazakhstan). 8–10 – total view: 8 – *Ch. bungei*, syntype, 9 – *Ch. magniceps* (syntype *Ch. birulai* var. *novosibirica*), 10 – *Ch. subsulcata* (syntype *Ch. birulai* var. *glacialis*). (After: Jacobson, 1910b: 8–10, others – orig.)



***Arctolina* figure 10:** 1 – *Chrysolina tshingilica,* male, holotype (China: China (Xinjiang: Altai). (After: Mikhailov, 2021: 1)

Subgenus *Atechna* Chevrolat, 1833

Diagnosis

Body very convex or semicircular, broadly oval or broadly obovate.

Color: head, pronotum, scutellum, and legs dark metallic, elytra rufous or red, with variable dark pattern.

Last maxillary palpomere cylindrical, 1.5–2.0 X longer than broad, similar in both sexes.

Antenna inserted 2.2–2.8 X closer to clypeus than to eye; narrow, with antennomeres 7–11 more or less broadened.

Orbital lines developed above eye, not reaching antennal insertion.

Pronotum very convex, broadest basally, with lateral sides rounded; without lateral impressions. Pronotal lateral sides very weakly swollen. Anterior side of pronotum marginated, with setae. Anterior setiferous pores present. Pronotal punctures different: 1) dense, very fine ones at whole surface, 2) fine, unevenly placed ones, 3) large, dense ones on lateral 1/5 –¼ of pronotum.

Prosternum with anterolateral portions broad, flat; intercoxal process longitudinally impressed (Fig. 6). Prothoracic hypomeron convex, laterally with transverse wrinkles delimited outside by narrow furrow; basal fold absent (Fig. 7).

Metasternum entirely marginated anteriorly.

Elytron with very weak humeral callus, with equidistant regular rows of dense punctures, which arranged in abbreviated scutellar row and 9 entire rows.

Epipleura inclined outside, visible along entire length in lateral view, densely ciliate along entire length.

Hind wings normally developed.

Tarsi: tarsomeres 1–3 with entire sole, narrow in female, broadened in male, claw tarsomere without denticles.

Last abdominal sternite weakly convex in both sexes.

Pygidium with deep sharp furrow along entire length.

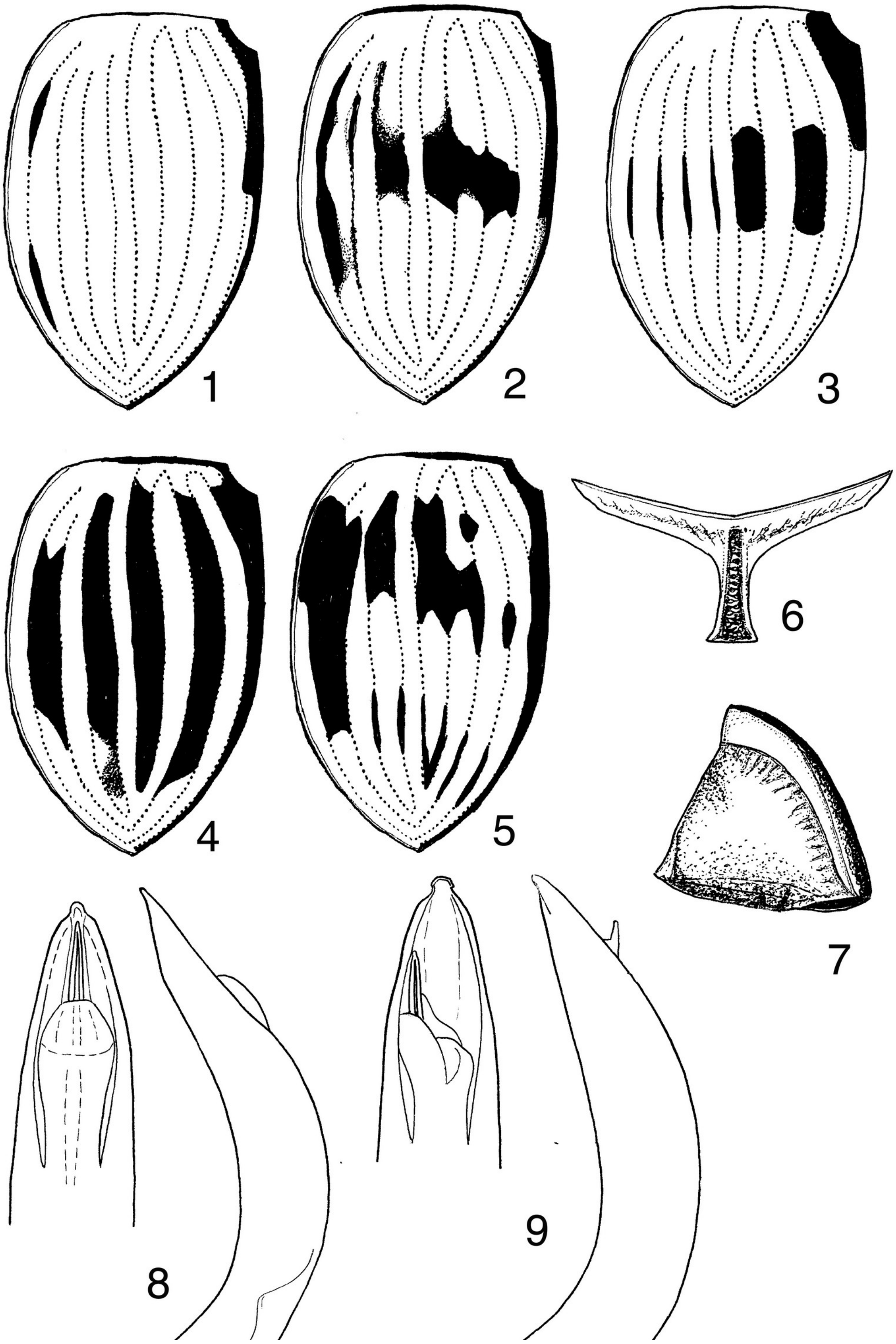
Differential diagnosis

Subgenus *Atechna* differs from subgenera *Polysticta* Hope, 1840, *Camerounia* Jolivet, 1949, and *Polystictella* Bechyné, 1952a in elytral epipleura inclined outside, visible along entire length in lateral view; it differs from *Pseudotimarchomima* Daccordi, 1980b and *Polysticta* in elytral epipleura bearing setae along entire length (only *Ch.* (*Polysticta) duodecimguttata* has epipleura with setae along entire length); it differs from *Camerounia* and *Pseudotimarchomima* in elytral punctures arranged in regular rows, and from *Camerounia, Psedotimarchomima*, and some species of *Polystictella* in developed hind wings.

Key to species

1(2) Elytron rufous with more or less developed dark stripe on interval 1 and mostly on intervals 3, 5, 7, 9; stripes sometimes joined together by transverse bands (Figs. 1–4). Punctures in 9th elytral row as large as those on pronotum laterally. Body smaller: 4.8–4.9 mm (male), 5.6–6.2 mm (female) long. Head, pronotum, scutellum, legs, and underside blackish bronze or blackish blue, all abdominal sternites laterally and sternites 3–5 apically rufous, epipleura rufous, darkened apically, tarsi piceous. Aedeagus – fig. 9. W, E, S Africa.
Ch. striata (Degeer, 1778)

2(1) Elytron dark red with blackish brassy or blackish blue reflection and irregular pattern before mid-length (Fig. 5). Punctures in 9th elytral row slightly finer than those on pronotum laterally. Body larger: 5.6 mm (male), 6.5–7.2 mm (female) long. Head, pronotum, scutellum, femora, tibiae, and underside blackish brassy or blackish blue, all abdominal sternites laterally and sternite 5 apically rufous, epipleura red, darkened apically, tarsi piceous. Aedeagus – fig. 8. S Africa.
Ch. tetraspilota (Vogel, 1870)



***Atechna* figures 1–9:** 1–5 – left elytron: 1–4 – *Chrysolina striata*, variability of elytral pattern: 1 – typical form (E Africa), 2 – variation "B" after Vogel, 1871 (S Africa), 3 – ab. *lineoligera* (S Africa), 4 – ab. *fasciata* (S Africa); 5 – *Ch. tetraspilota* (S Africa); 6–7 – *Ch. tetraspilota*, female: 6 – prosternum, 7 – prothoracic hypomeron; 8–9 – male aedeagus, dorsal and lateral view: 8 – *Ch. tetraspilota* (S Africa), 9 – *Ch. striata* (W Africa). (Orig.)

Subgenus *Atlasiana* Bourdonné et Doguet, 1991

Diagnosis

Body very convex, broadly oval. Dorsum reddish with metallic tint, or partly bright metallic, or entirely metallic (green or purple); antennae yellow or brown, legs rufous or metallic with rufous tarsi.

Last maxillary palpomere oval, obliquely truncate, as wide as penultimate, 1.5 X longer than latter; almost similar in both sexes.

Antenna inserted closer to clypeus than to eye; narrow, with antennomeres 6–11 longer than broad, weakly broadened.

Orbital line distinct, present only above eye, not reaching antennal insertion.

Pronotum very convex, broadest basally or at mid-length, with lateral sides arc-shaped. Anterior angles strongly produced. Anterior side of pronotum marginated, with setae. Anterior setiferous pore absent. Pronotum laterally weakly swollen along entire length, convex from side to side, without any lateral impressions, but covered laterally by numerous large, not confluent punctures. Pronotal disc with dense, fine punctules.

Prothoracic hypomeron almost flat, in *Ch. pourtoyi* with narrow lateral furrow, laterally without wrinkles or with obsolete wrinkles. Basal fold distinct.

Prosternum: intercoxal prosternal process narrow, broadened posteriorly, with narrow callus along entire length in *Ch. seriatopora* (Fig. 1: 3) and *Ch. pourtoyi*, weakly convex in *Ch. abchasica*. Anterolateral portions of prosternum with strong ridge margined posteriorly by impression. Metasternum entirely marginated anteriorly.

Elytron without humeral callus; striato-punctate, with 10 regular entire rows of moderate or large punctures and abbreviated scutellar row. Rows 2–3, 4–5, 6–7, and 8–9 more or less paired. Intervals flat, covered by sparse fine punctures, with additional moderately large punctures in *Ch. abchasica* (Fig. 3: 1). Sutural stria absent in *Ch. pourtoyi,* distinct at apical slope in other species.

Epipleura inclined outside, visible along entire length in lateral view, ciliate near apex.

Hind wings present, but reduced, narrow.

Tarsomeres 1–3 with entire sole in both sexes; in female they are narrow (Figs. 1: 12, 13; 2: 1); in male tarsomeres 1 and 3 more or less broadened in fore tarsi, tarsomere 1 broadened in mid and hind tarsi (Figs. 1: 7, 8; 3: 4). Claw tarsomere without denticles beneath.

Pygidium with deep longitudinal furrow with vertical borders along almost entire length, but not reaching apex in *Ch. seriatopora*, evenly convex, without impression in *Ch. abchasica*.

Male last abdominal sternite evenly convex in *Ch. pourtoyi,* or sternite convex, with shallow impression in apical part in the others, female last abdominal sternite evenly convex, arc-shaped and marginated apically.

Aedeagus short and broad, flattened and curved dorso-ventrally. Flagellum narrow, simple, exposed or not.

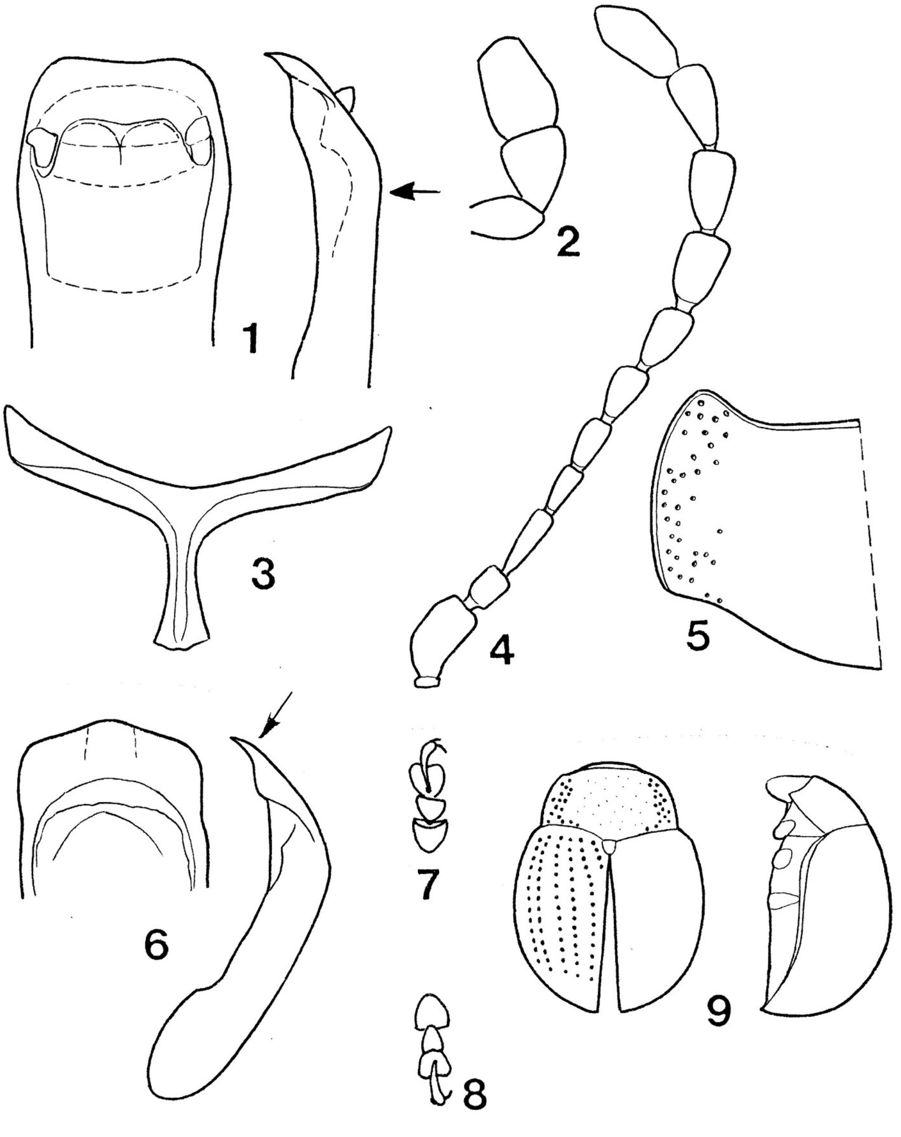
Differential diagnosis

This subgenus distinctly differs from any other *Chrysolina* occurring in Mediterranean region and the Caucasus in the combination of the following characters: body very convex, shining, reddish, with strong metallic tint or bright metallic dorsally, antennae yellow or brown, pronotum very convex from side to side, without any lateral impressions, elytra without humeral calli, with regular puncture rows.

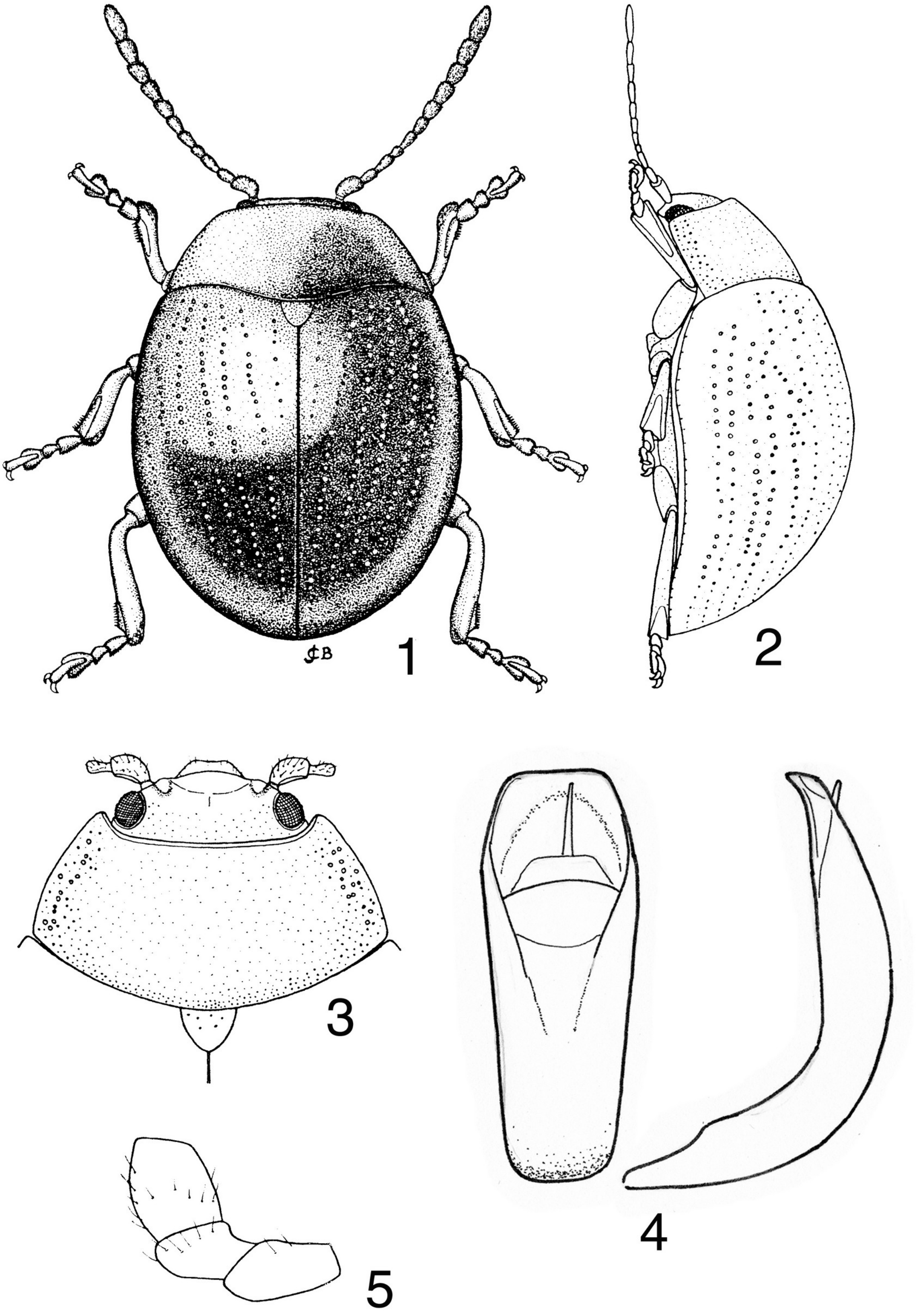
Atlasiana differs from rather similar subgenus *Hypericia* Bedel, 1899 in pronotal lateral impressions always absent, and aedeagus of quite different shape: broad and flattened dorso-ventrally.

Key to species

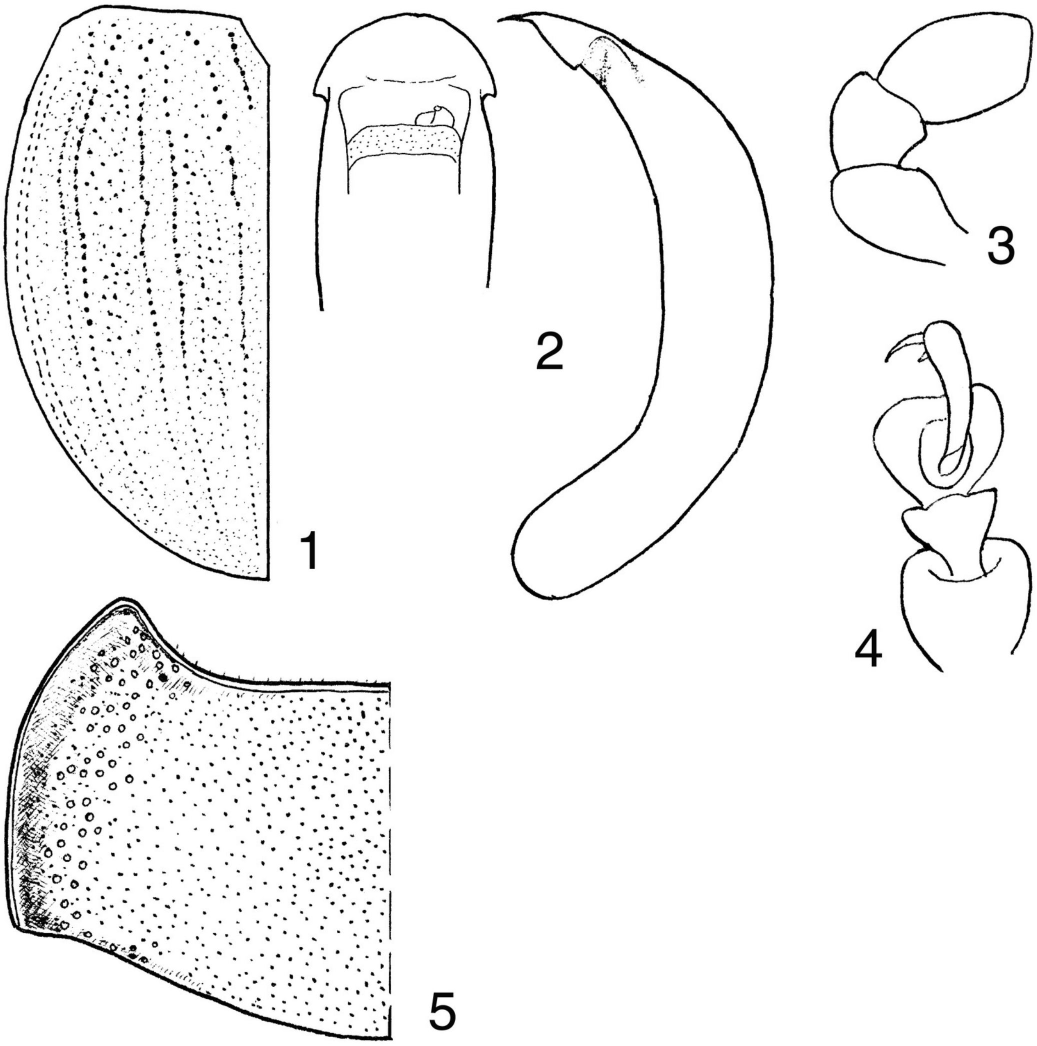
1(2) Dorsum reddish or rufous with strong greenish or golden greenish tint; antennae and tarsi yellow. Aedeagus with apical denticles wrapped on the underside and invisible from above. Prosternum with distinct longitudinal ridge. Species from N Africa. Length: 5.1–5.3 mm (male), 5.8 mm (female). Fig. 1: 1–13.
Ch. seriatopora (Fairmaire, 1867)
2(1) Dorsum metallic. Species from Europe and the Caucasus.
3(4) Body smaller (length: 4.5–5.0 mm). Dorsum dark green, moderately shining; antennae yellowish, legs rufous. Aedeagus without apical denticles, with flagellum exposed. Prosternum with distinct longitudinal callus. Species from France (Atlantic Pyrenees). Fig. 2: 1–5.
Ch. pourtoyi Bourdonné, 1996
4(3) Body larger (length 5.5–6.2 mm). Dorsum purple, weakly shining or sericeous; antennae yellow or brown. Aedeagus laterally with apical denticles visible from above, with flagellum slightly exposed. Prosternum without longitudinal ridge. Species from the Caucasus. Fig. 3: 1–5.
Ch. abchasica (Weise, 1892b)



***Atlasiana* figure 1:** *Chrysolina seriatopora*: 1–5 – male (Tunisia): 1 – aedeagus, dorsal and lateral view (arrow indicates the plane of dorsal view), 2 – maxillary palpus, 3 – prosternum, 4 – antenna, 5 – pronotum, dorsal view; 6–10 – male (Algeria): 6 – aedeagus, dorsal and lateral view (arrow indicates the plane of dorsal view), 7 – fore-tarsus, 8 – hind-tarsus, 9 – dorsal and lateral view, 10 – last abdominal sternite; 11–13 – female (Algeria): 11 – maxillary palpus, 12 – fore-tarsus, 13 – hind tarsus. (Orig.)



***Atlasiana* figure 2:** *Chrysolina pourtoyi*: 1–2 – female (holotype, Pyrenees), dorsal and lateral view, 3–5 – male (paratype, Pyrenees): 3 – head and pronotum, 4 – aedeagus, dorsal and lateral view, 5 – maxillary palpus. (After: Bourdonné, 1996: 1–3, 5; fig. 4 – orig.).



Atlasiana **figure 3:** *Chrysolina abchasica*, male (W Caucasus): 1 – left elytron, dorsal view, 2 – aedeagus, dorsal and lateral view, 3 – maxillary palpus, 4 – fore-tarsus, 5 – pronotum. (Orig.)

Subgenus *Bechynia* Bourdonné, 1977

Diagnosis

Color: body bronze or black, underside with violet or blue reflection.

Last maxillary palpomere oval, beveled, as wide as penultimate palpomere or slightly wider, as long as penultimate palpomere, or slightly longer, or slightly shorter than latter; in male slightly broader than in female or last maxillary palpomere similar in both sexes.

Orbital lines distinct, broadened anteriorly, reaching antennal insertions in *Ch. milleri*, deeply incised, not reaching antennal insertion in *Ch. philotesia* and *Ch. platypoda*.

Antenna inserted about 2 X closer to clypeus than to eye. Antennomeres 6–11 moderately broadened.

Pronotum broadest basally or just before base, with lateral sides arc-shaped and convergent anteriorly. Anterior angles moderately produced. Anterior side marginated, with dense setae. Anterior setiferous pore present in *Ch. platypoda*, absent in the others. Pronotum laterally swollen along entire length. Pronotal lateral impressions deep in basal ⅓; they wide, shallow or obsolete and covered by more or less large punctures in anterior ⅔.

Prothoracic hypomeron more or less convex, more or less impressed and covered by irregular wrinkles along outside. Basal fold distinct. Intercoxal prosternal process narrow, slightly broadened posteriorly, convex along entire length in *Ch. milleri*, with lateral ridges in *Ch. philotesia* and *Ch. platypoda*. Anterolateral portions of prosternum flat with scarp before posterior border in *Ch. milleri* and *Ch. platypoda*, or with narrow ridge, delimited anteriorly and posteriorly by impressions in *Ch. philotesia*.

Metasternum entirely marginated anteriorly.

Elytral puncturation differs in different species: 1) elytron covered by large, dense punctures, mostly or entirely irregular; with intervals rugose, covered by dense fine punctures; or 2) large punctures arranged in paired rows which mostly irregular and distinct only near base, and intervals covered by fine and very sparse punctures. Sutural stria distinct.

Epipleura inclined outside, visible along entire length in lateral view, ciliate apically.

Hind wings absent in *Ch. milleri*, they narrow, reduced, reaching base of pygidium in the others.

Tarsomeres 1–3 with entire sole in both sexes. In male, all tarsomeres 1–3 broadened, fore tarsomere 1 as broad as apex of fore tibia, or broader than latter. In female, all tarsomeres 1–3 narrow, fore tarsomere 1 1.1–1.2 X narrower than apex of fore tibia. Claw tarsomere without denticles beneath.

Pygidium with longitudinal furrow.

Male last abdominal sternite with medial longitudinal furrow in anterior ⅓ and broad impression in posterior ⅔, or with medial longitudinal furrow along entire length, with apical margin bisinuate and marginated. Female last abdominal sternite convex.

Aedeagus tube-shaped, moderately curved dorso-ventrally; flagellum broad, with lateral sides wrapped to the middle.

Differential diagnosis

The members of the subgenus *Bechynia* externally resemble species of the subgenus *Threnosoma* Motschulsky, 1860a and differ from them in last maxillary palpomere as wide as penultimate (last maxillary palpomere slightly narrower than penultimate in the species of *Threnosoma* except *Ch. weisei* (Frivaldszky, 1883)), male 2nd fore tarsomere as broad as 1st (male 2nd fore tarsomere narrower than 1st in *Threnosoma*), male last abdominal sternite with longitudinal impression (male last abdominal sternite evenly convex in *Threnosoma*), aedeagus with flagellum broad and narrowly incised at apex (flagellum is narrow, simple in *Threnosoma*).

Bechynia also differs from *Maenadochrysa* Bechyné, 1950a in femora never rufous, pronotal lateral impression deep and furrow-shaped in basal ⅓, hind wings very reduced or absent, male last abdominal sternite with longitudinal impression, aedeagus with flagellum incised apically.

All species of *Bechynia* differs from *Ch.* (*Sibiriella) montana* (Gebler, 1848) in pronotal lateral impression deep in basal ⅓, pygidium with longitudinal furrow along entire length. Flagellum of aedeagus is also quite different: it is broad in all *Bechynia* members, and only narrowly and shortly incised in the *Bechynia* members except *Ch. platypoda*, in which flagellum without incision; but flagellum is narrow, bifurcate at the very end in *Ch. montana*.

Two members of *Bechynia*, namely *Ch. milleri* and *Ch. platypoda*, are externally rather similar with *Ch.* (*Chalcoidea) carnifex melanaria* and differ, besides the aedeagus structure, in the male tarsomeres 1–3 much broader, and male last abdominal sternite with distinct medial impression.

Key to species

1(4) Elytral large punctures dense, entirely irregular (Figs. 1: 7; 2: 9).
2(3) Elytral punctures distinctly double: large ones mixed with irregular fine punctures. Pronotal lateral furrow moderately deep. Aedeagus without

apical emargination (Fig. 2: 1). In male, last abdominal sternite with medial longitudinal furrow in anterior ⅓ and broad impression in posterior ⅔, fore tarsomere 1 as broad as apex of fore tibia. Dorsum moderately shining (male) or dull (female). Body black with weak violet or blue reflection on underside, legs, and in pronotal lateral impressions. Length: 7.8–8.1 mm (male), 9.0–9.4 mm (female). Fig. 2: 1–9. Balkan Penins.

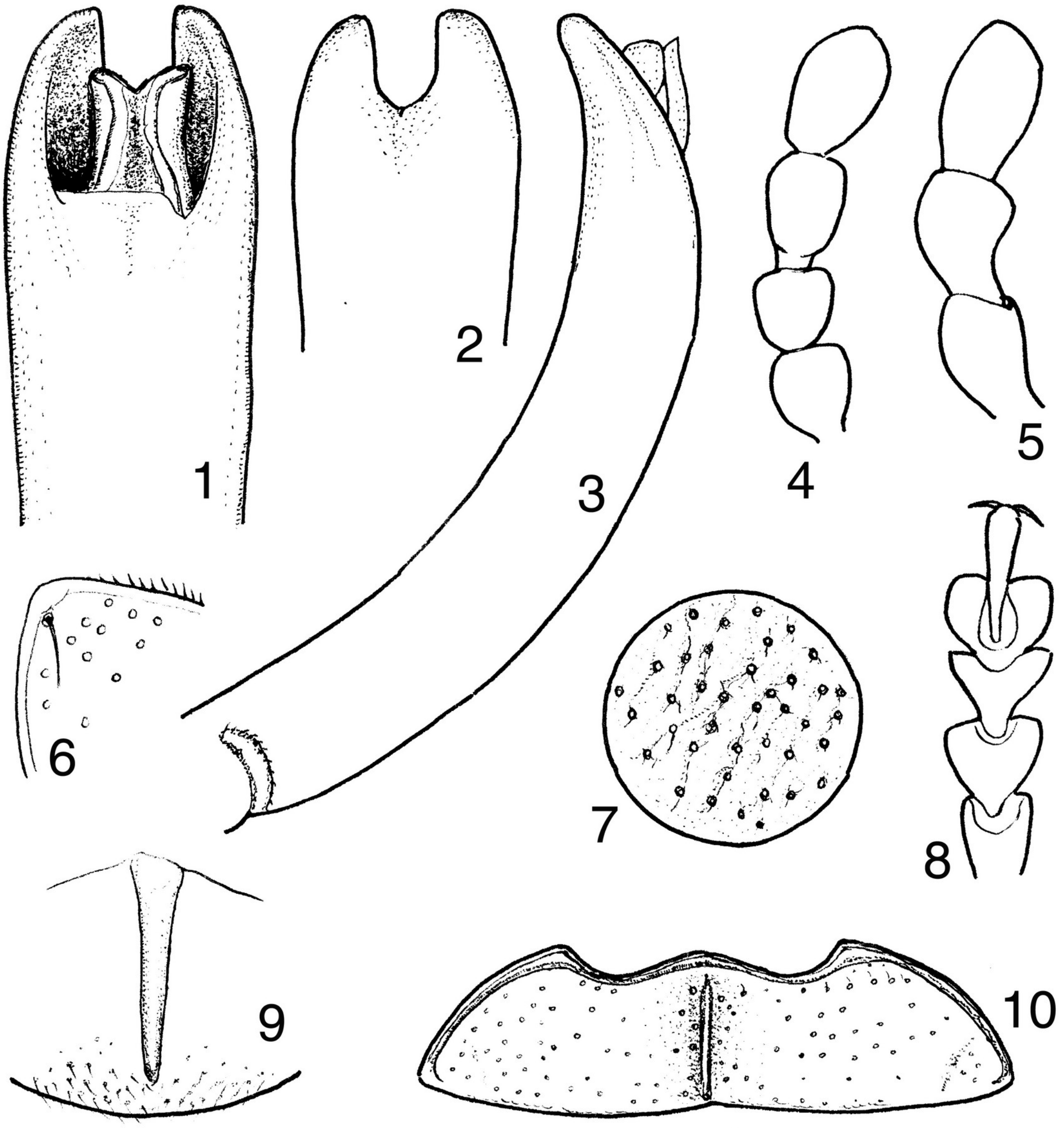
Ch. milleri (Weise, 1884b)

3(2) Elytral punctures look like homogenous. Pronotal lateral furrow very deep, narrow. Aedeagus with deep apical emargination (Fig. 1: 1, 2). In male, last abdominal sternite with medial longitudinal furrow along entire length, fore tarsomere 1 broader than apex of fore tibia. Dorsum black, moderately shining, underside, fore- and mid-femora in apical ½, and fore- and mid-tibiae greenish, fore- and mid-femora in basal ½, hind legs, fore- and mid-tarsi violet. Length: 9.2 mm (male), female is unknown. Fig. 1: 1–10. S France.

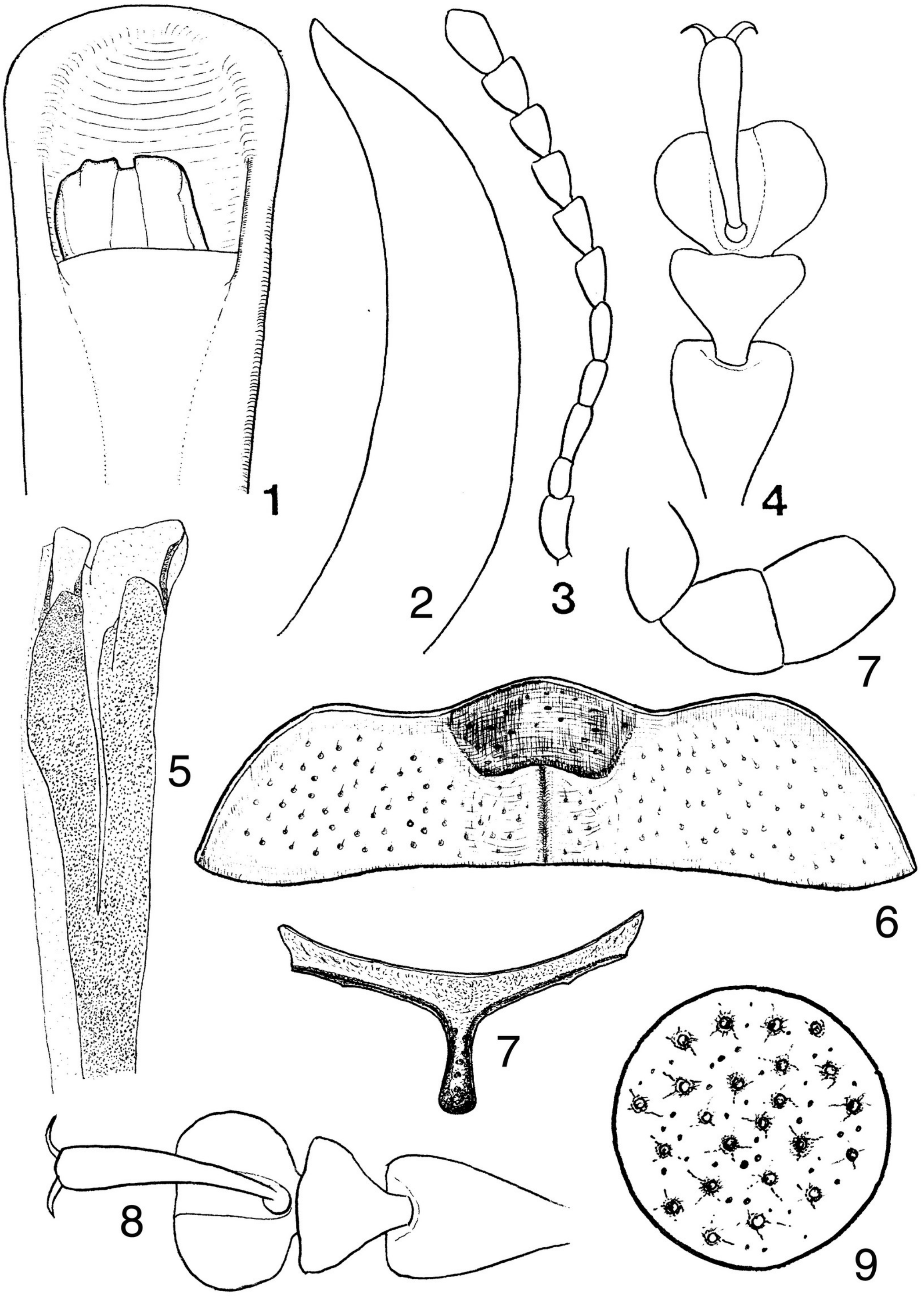
Ch. platypoda Bechyné, 1950a

4(1) Elytral large punctures sparse, mostly arranged in distinct irregular rows with broad intervals, covered with fine irregular punctures (Fig. 3: 1, 5). Aedeagus with weak apical emargination (Fig. 3: 2). In male head and pronotum dark bronze, shining, elytra dull, dark bronze with greenish lateral outermost interval, elytral epipleura, abdominal sternites and legs bluish black. In female dorsum dull, weakly sericeous, dark bronze with golden reflection, underside, antennae, and legs black. Length: 8.3 mm (male), 8.6 mm (female). Fig. 3: 1–7. Greece.

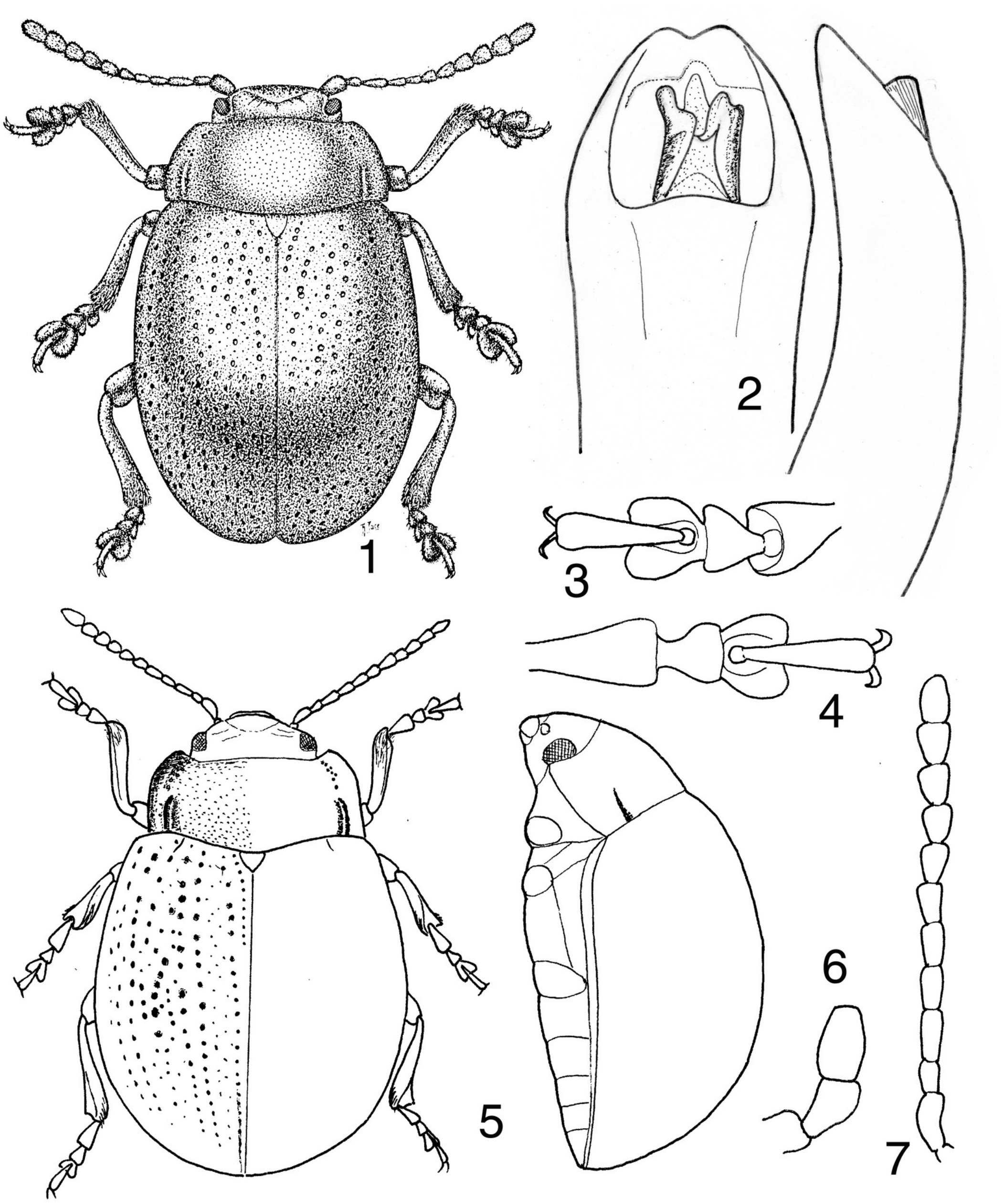
Ch. philotesia Daccordi et Ruffo, 1980



***Bechynia* figure 1:** *Chrysolina platypoda*, male (holotype, S France): 1–3 – aedeagus, dorsal, ventral, and lateral view, 4 – antennomeres 8–11, 5 – maxillary palpus, 6 – left anterior corner of pronotum with setiferous pore, 7 – punctures of elytron, 8 – fore-tarsomere, 9 – pygidium, 10 – last abdominal sternite. (Orig.)



Bechynia figure 2: *Chrysolina milleri*, male: 1 – aedeagus, dorsal view, 2 – aedeagus, lateral view, 3 – antenna, 4 – fore-tarsus, 5 – flagellum of aedeagus, 6 – last abdominal sternite, 7 – prosternum, 8 – hind-tarsus, 9 – elytral punctures. (Orig.)



***Bechynia* figure 3:** *Chrysolina philotesia*: 1–2 – male (holotype, Greece): 1 – dorsal view, 2 – aedeagus, dorsal and lateral view; 3–7 – female (Greece, Peloponnese): 3 – fore-tarsus, 4 – hind-tarsus, 5 – dorsal and lateral view, 6 – maxillary palpus, 7 – antenna. (After: Daccordi, Ruffo, 1980: 1; others – orig.)

Subgenus *Bittotaenia* Motschulsky, 1860a

Diagnosis

Body elongate-oval or elongate-obovate, moderately or slightly convex.

Dorsum black or metallic (blue, bronze, green, violet), unicolorous, or pronotum and elytra differently colored, or elytra bronze with violet spots.

Last maxillary palpomere oval, beveled, longer than broad, slightly narrower than penultimate one, similar in both sexes or slightly broader in male, than in female.

Antenna inserted at middle between clypeus and eye or closer to clypeus than to eye.

Pronotum laterally swollen at the entire length. Lateral impressions narrow, mostly furrow-shaped, distinct along entire length of pronotum. Anterior side of pronotum marginated, with setae. Anterior setiferous pore present.

Prothoracic hypomeron more or less convex, with narrow smooth border laterally, this border margined interiorly by narrow impression filled by wrinkles. Basal fold present.

Intercoxal prosternal process impressed along entire length, with elevated lateral borders. Anterolateral portions of prosternum convex or almost flat, with furrow along posterior margin.

Metasternum entirely marginated anteriorly.

Humeral calli weak. Elytra with regular paired puncture rows, intervals flat or slightly convex.

Epipleura inclined outside, visible along entire length in lateral view, densely ciliate near apex.

Hind wings as long as elytra or some longer.

In male fore- and mid-tarsomeres 1–3 slightly or moderately broadened, tarsomere 1 of fore- and mid-tarsi, tarsomeres 1–3 of hind-tarsi (in *Ch. compuncta* – tarsomeres 1 only) with glabrous stripe beneath (in *Ch. mellyi* fore tarsomere 1 sometimes without glabrous stripe); in female all tarsomeres 1–3 narrow, with glabrous stripe beneath. Claw tarsomere without denticles beneath.

Pygidium bearing distinct furrow with vertical lateral borders along entire length (in *Ch. compuncta, Ch. salviae*), or shallow to moderate impression along entire length (in *Ch. aeneipennis, Ch. grata, Ch. mellyi, Ch. turanica*) or impression developed only basally (in *Ch. mellyi*, partly).

Last abdominal sternite evenly convex in both sexes, rounded (in female) or broadly truncate (in male) apically.

Aedeagus oval in cross-section, evenly curved, with parallel sides at almost entire length. Apex broadly truncate, or rounded, or {-shaped, with 2 denticles ventrally. Flagellum narrow, hardly exposed.

Differential diagnosis

Bittotaenia is peculiar because of the combination of elongate body, pronotal lateral impressions narrow and distinct along entire length, elytra with paired puncture rows, hind wings developed, tarsomeres 1–3 of hind tarsi of male and all tarsomeres 1–3 of female with broad glabrous stripe beneath.

Key to species and subspecies

1(4) Punctures in elytral rows sparse, 7–14 and 5–15 in 4th and 5th row, respectively.

2(3) Male: tarsomeres 2 and 3 of hind tarsi with entire sole. Elytra with 7–11 and 5–11 punctures in 4th and 5th row, respectively; intervals covered by fine to obsolete punctures, which finer than those at pronotal disc. Elytra golden green or coppery, each puncture in elytral rows margined by dark violet spot (Fig. 1: 5), these spots 4–9 X broader than the respective punctures; head and pronotum golden green or coppery. Length: 7.0–7.2 mm (males), 8.6–8.8 mm (females). Figs. 1: 5–8; 2: 1, 5, 6; 4. Asia Minor, Syria, Palestine, Cyprus.
Ch. compuncta (Weise, 1898)

3(2) Male: tarsomeres 2 and 3 of hind tarsi with glabrous stripe beneath. Elytra with 8–14 and 10–15 punctures in 4th and 5th row, respectively; intervals covered by fine punctures, which as large as punctures at pronotal disc, or larger than latters. Elytra unicolorous or each puncture in elytral rows margined by dark violet spot. Fig. 4.
Ch. salviae (C.R. Sahlberg, 1823)

(a) subsp. *salviae*. Europe, Caucasus, Near East. Dorsum moderately shining or dull. Coloration variable: 1) dorsum entirely violet or with pronotal disc golden green, 2) head and pronotum green, elytra violet, 3) dorsum entirely blue, 4) dorsum green with scutellum violet, 5) head and pronotum violet (or with lateral calli green), elytra green or bronze, 6) dorsum entirely bluish green or bronze-green, 7) dorsum purely black, or black with greenish bronze, golden, or bluish reflection, 8) head, elytra and pronotal calli bluish green, pronotal disc and scutellum violet, 9) head green, pronotum green with lateral impressions violet, elytra violet, 10) dorsum golden green, or bluish green, or bronze, each puncture in elytral rows margined by dark violet spot, which 2–5 X broader than the respective puncture. Length: 6.7–8.2 mm (males), 8.2–9.9 mm (females). Fig. 2: 2.

(b) subsp. *catalonica* (Bechyné, 1950a). Spain. Dorsum shining, elytra brown with strong bronze reflection, head, pronotum, and scutellum dark bronze. Length: 8.8–9.1 mm (female).

4(1) Punctures in elytral rows dense, 23–37 and 25–38 in 4th and 5th row, respectively.

5(6) Head and pronotum dark blue or violet, scutellum and elytra bronze or rufous with bronze reflection. Species from Near East. Length: 8.0–9.2 mm (males), 8.0–8.3 mm (females). Figs. 1: 1–4; 3: 3, 4; 4.
Ch. aeneipennis (Reiche et Saulcy, 1858)

6(5) Pronotum and elytra not so contrast colored.

7(8) Aedeagus rather strongly broadened at sides of apical opening (Fig. 2: 3, 4). Species widely distributed in Asia: Turkmenistan, N Iran, Transcaucasia, Afghanistan, Turkey, and Iraq. Fig. 4.
Ch. grata (Faldermann, 1837)

(a) subsp. *grata*. Turkey, Transcaucasia, Turkmenistan, Iraq, N Iran, Afghanistan. Dorsum dark violet, head and pronotum moderately shining or dull, elytra dull. Elytral puncture rows invisible among irregular punctures of intervals in apical ⅓. Length: 7.0–9.8 mm (males), 9.0–10.1 mm (females). Figs. 2: 3; 3: 5, 6.

(b) subsp. *brancuccii* (Daccordi, 1982b). Oman. Dorsum black with weak greenish reflection or dorsum greenish blue. Head and pronotum moderately shining, elytra sericeous in female; elytra more shining than pronotum in male. Elytral puncture rows becoming gradually finer posteriorly, rows distinct till apex. Length: 8.3 mm (male), 9.1 mm (female).

(c) subsp. *derelicta* (Marseul, 1887). Rhodes Isl., Syria. Dorsum moderately shining, greenish bronze, or with elytra brown with strong greenish bronze reflection, elytra laterally, elytral epipleura, and body ventrally rufous with strong bronze reflection. Elytral puncturation as in nominotypical subspecies. Length: 8.5–9.0 mm (males), 8.5–9.2 mm (females). Fig. 2: 4.

(d) subsp. *leonardii* (Daccordi, 1976d). Egypt. Dorsum violet. Elytral puncture rows distinct till apex. Length: 9.8 mm (male), 10.6 mm (female). Fig. 2: 7.

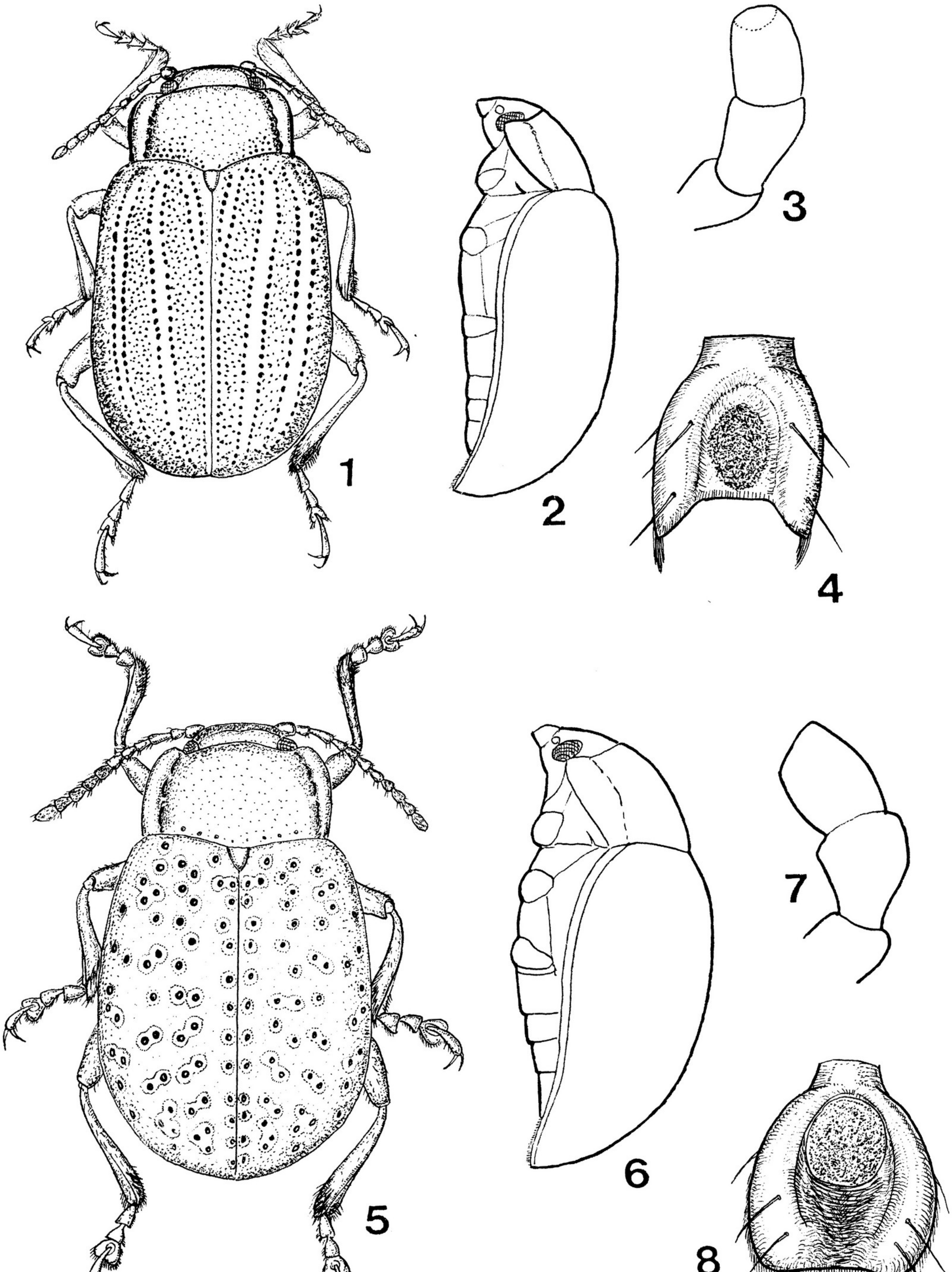
(e) subsp. *nigrolucens* (Lopatin, 1985). C Iran. Dorsum more shining than in nominotypical subspecies, black with very weak bronze or violet reflection. Elytral puncturation as in nominotypical subspecies. Length: 8.3–9.0 mm (males), 9.7–10.2 mm (females).

8(7) Aedeagus not so strongly broadened at sides of apical opening (Fig. 3: 1, 2).

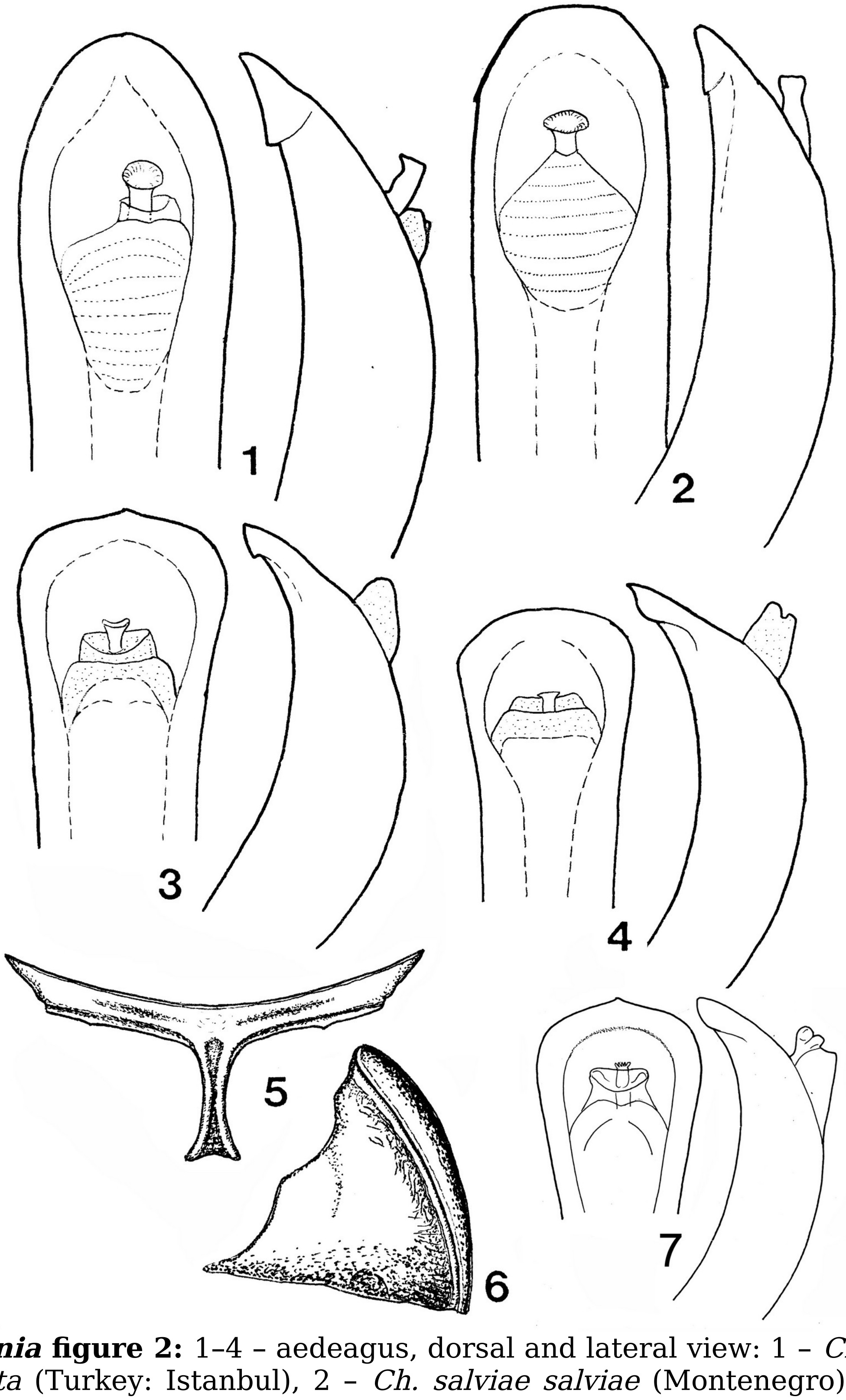
9(10) Dorsum violet, sometimes, anterior and posterior margins of pronotum and pronotal lateral furrows (impressions) blue. Aedeagus laterally very weakly broadened towards apical opening and then almost parallel, slightly emarginated at sides of apical opening (Fig. 3: 1). Species from

Afghanistan, N India, Sikkim, Tibet, N Pakistan. Length: 8.2–8.8 mm (males), 8.9–9.6 mm (females). Fig. 4.
Ch. mellyi (Stål, 1857)

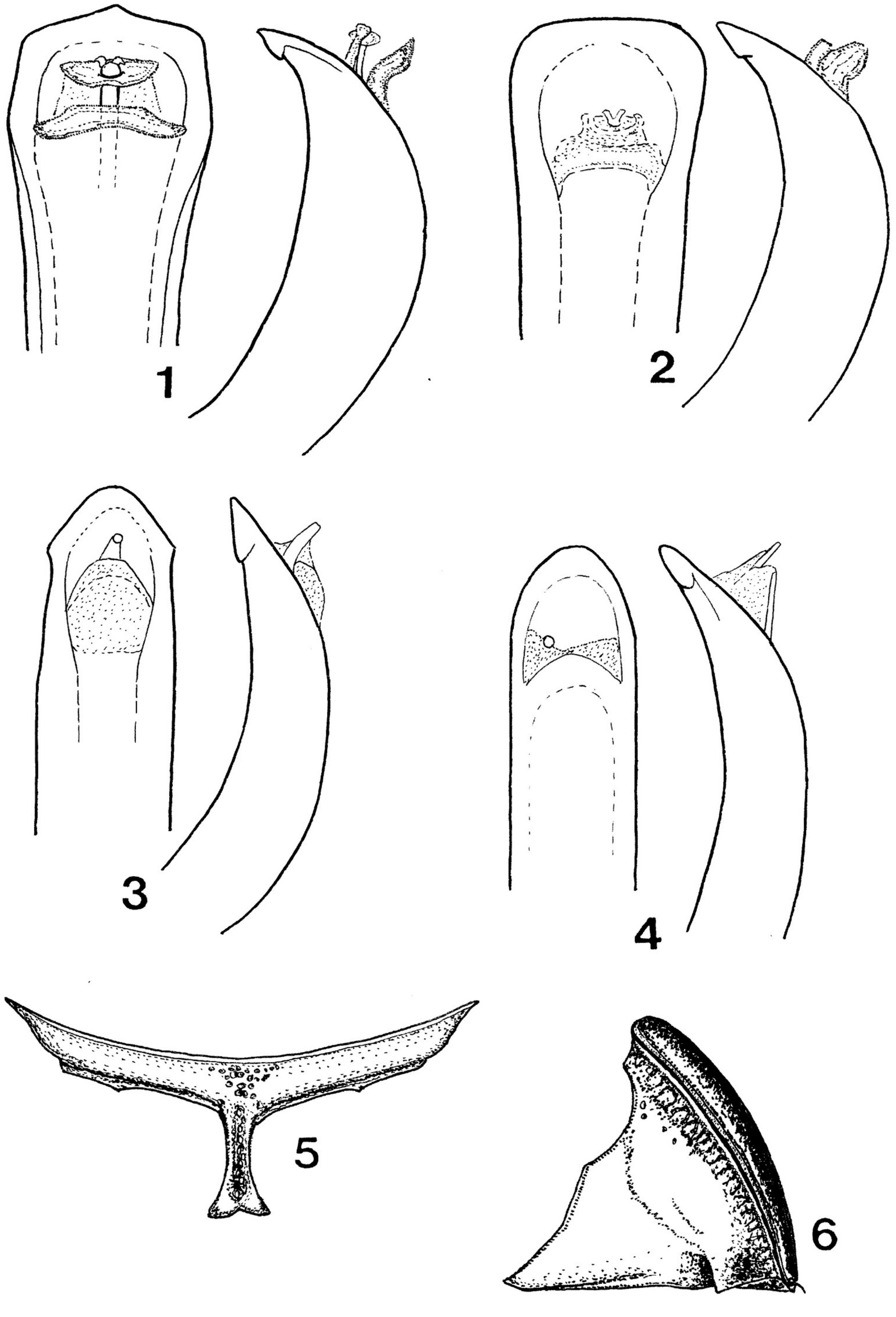
10(9) Dorsum black with or without weak bronze, golden green, or violet reflection. Aedeagus gradually slightly broadened at sides of apical opening (Fig. 3: 2). Species from Armenia, Azerbaijan, Turkmenistan and Tajikistan. Length: 8.5–8.9 mm (males), 9.0–10.2 mm (females). Fig. 4.
Ch. turanica (Reitter, 1889)



***Bittotaenia* figure 1:** 1–4 – *Chrysolina aeneipennis*, female (Libya: Tripolitania): 1 – dorsal view, 2 – lateral view, 3 – maxillary palpus, 4 – third hind tarsomere; 5–8 – *Ch. compuncta*, male (Lebanon): 5 – dorsal view, 6 – lateral view, 7 – maxillary palpus, 8 – third hind tarsomere. (Orig.)

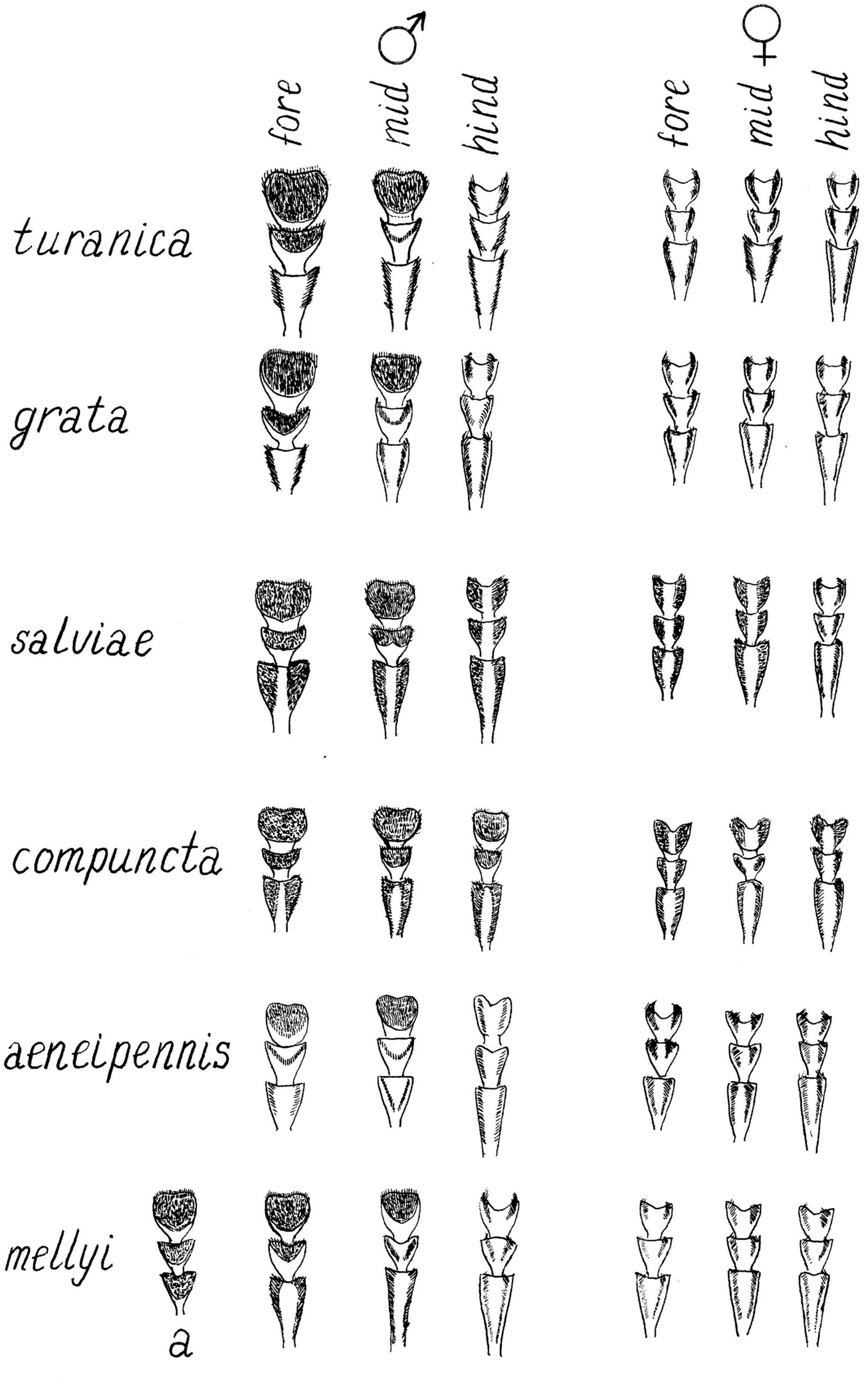


***Bittotaenia* figure 2:** 1–4 – aedeagus, dorsal and lateral view: 1 – *Chrysolina compuncta* (Turkey: Istanbul), 2 – *Ch. salviae salviae* (Montenegro), 3 – *Ch. grata grata* (Turkmenistan), 4 – *Ch. grata derelicta* (Syria); 5–6 – *Ch. compuncta*, male (Turkey: Istanbul): 5 – prosternum, 6 – prothoracic hypomeron; 7 – *Ch. grata leonardii* (paratype *Crosita leonardii*, Sinai), aedeagus, dorsal and lateral view. (Orig.)



***Bittotaenia* figure 3:** 1–4 – aedeagus, dorsal and lateral view: 1 – *Chrysolina mellyi* (Afghanistan), 2 – *Ch. turanica* (Turkmenistan), 3–4 – *Ch. aeneipennis*

(3 – Jordan, 4 – Israel); 5–6 – *Ch. grata*, male: 5 – prosternum, 6 – prothoracic hypomeron. (Orig.)


♂
fore
mid
hind
♀
fore
mid
hind
turanica
grata
salviae
compuncta
aeneipennis
mellyi
a

***Bittotaenia* figure 4:** Tarsal sole (a – *Chrysolina mellyi,* male fore-tarsus, variability, Afghanistan: Kabul). (Orig.)

Subgenus *Cecchiniola* Jacobson, 1908

Diagnosis

Shape: convex, broadly oval (Fig. 1: 1, 2).

Dorsum distinctly shagreened, with dense punctules (punctules as large as cells of microsculpture) on head and pronotum; sericeous or dull. Dorsum black with weak blue or violet reflection, underside blackish blue or violet, antennae piceous with antennomere 1 rufous apically, antennomere 2 rufous below.

Last maxillary palpomere (Fig. 1: 6) oval, beveled, 1.5 X longer than broad, as long as penultimate palpomere and 1.2 X narrower than latter; similar in both sexes.

Antenna inserted 1.5–1.9 X closer to clypeus than to eye; reaching pronotal base. Antennomeres 6–11 moderately broadened. Antennomere 10 as long as broad.

Orbital line broad, projects along interior border of eye and curved towards mid-line above antennal insertion.

Pronotum convex, broadest before base, with lateral sides arc-shaped, strongly convergent anteriorly and very weakly convergent posteriorly. Anterior angles slightly produced. Anterior side of pronotum entirely and very finely marginated, with very dense setae. Anterior setiferous pore absent. Pronotum laterally very weakly swollen along entire length. Pronotal lateral impressions obsolete along almost entire length, and furrow-shaped, shallow, filled by coalescent punctures in basal ¼–1/5 only. Punctures at pronotal disc dense, fine medially, slightly larger laterally.

Prothoracic hypomeron (Fig. 1: 8) weakly or moderately convex, laterally with irregular wrinkles and sometimes with narrow shallow furrow. Basal fold distinct.

Prosternum – fig. 1: 7. Intercoxal prosternal process narrow between coxae, broadened apically, covered by irregular wrinkles. Anterolateral portions of prosternum narrow, ridge-shaped.

Metasternum entirely marginated anteriorly.

Elytron without humeral callus; densely finely punctate. Punctures mostly confuse, only 9th and 10th rows (both abbreviated and undulate), sometimes also 1st–6th rows hardly visible among irregular puncturation. Marginal stria with dense punctures slightly larger than those at elytral disc. Sutural stria absent.

Epipleura inclined outside, visible along entire length in lateral view, densely ciliate near apex.

Hind wings absent.

Tibiae angularly dilated apically (Figs. 1: 1; 2: 7).

Tarsi: male (Fig. 2: 4–6): tarsomeres 1–3 broadened in fore tarsi; mid- and hind-tarsomere 1 with glabrous stripe beneath; female (Fig. 1: 3–5): tarsi narrow, all tarsomeres 1 and 2 with glabrous stripe beneath, hind-tarsomere 3 with very narrow glabrous stripe beneath. Claw tarsomere without denticles beneath.

Pygidium with longitudinal furrow margined by vertical borders, slightly not reaching apex of pygidium.

Last abdominal sternite: in male: with longitudinal furrow or without it, with large, rounded, more or less deep medial impression along entire length, with apical margin bisinuate; in female: convex and slightly swollen, with apical margin rounded.

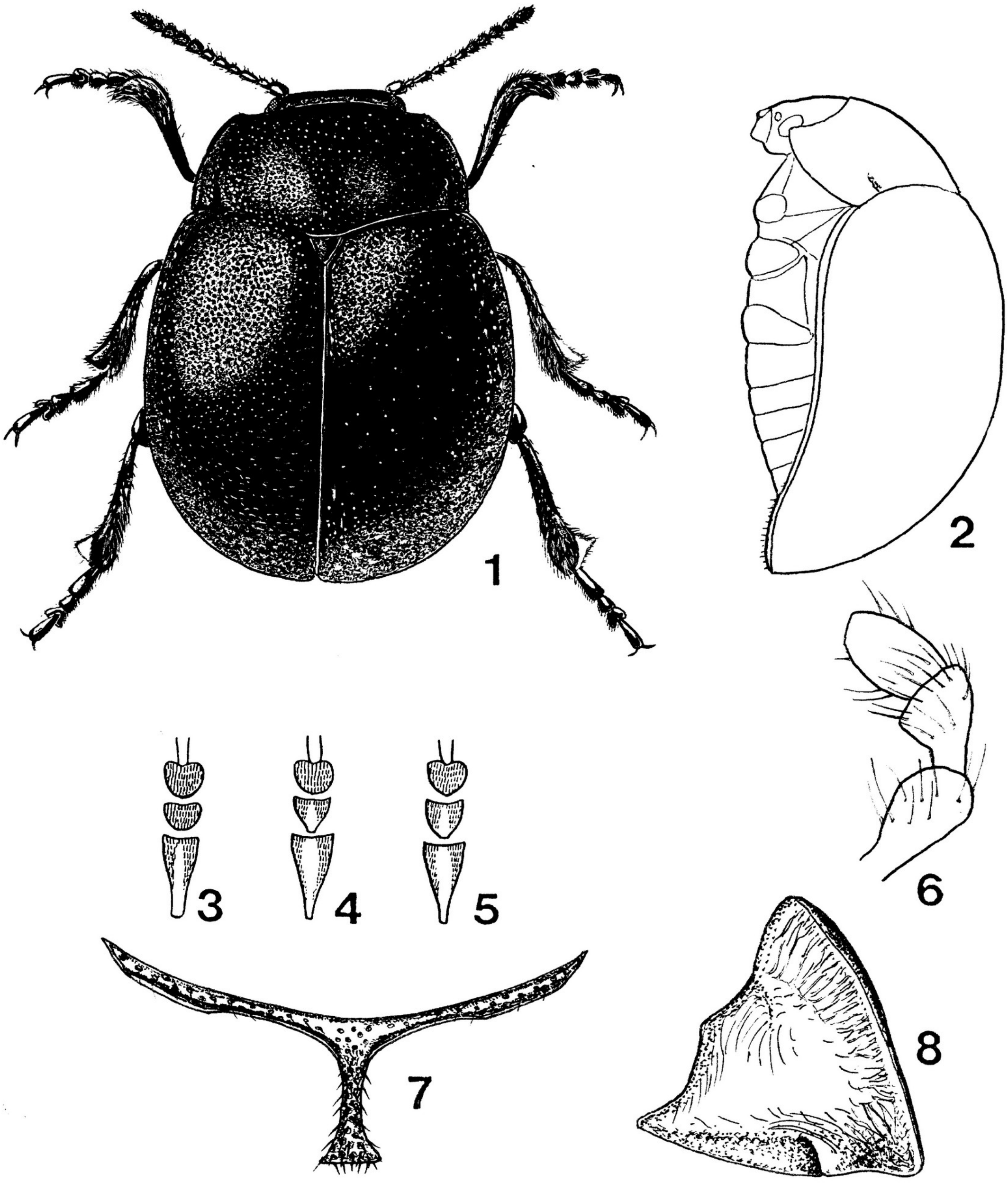
Length: 7.7–9.0 mm.

Aedeagus (Fig. 2: 1–3) 3.4 mm long, very complicated: emarginated apically, with apical opening bearing two pairs of membranous lobes, exterior pair large, projected, inner pair small, both pairs with strongly sclerotized interior margin.

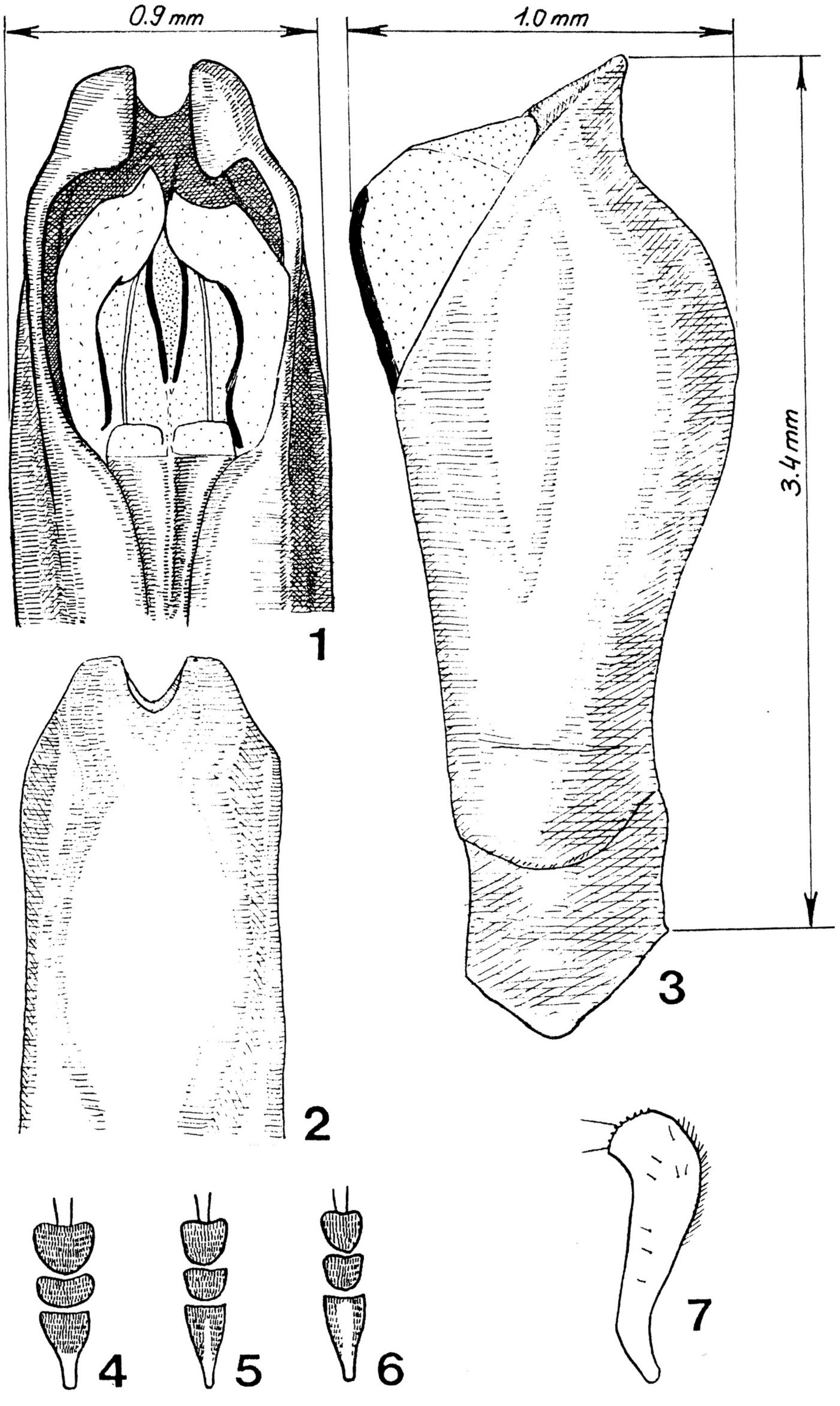
Differential diagnosis

The shape of tibiae (broadened apically) permits us to distinguish *Cecchiniola*, inhabiting the Crimean Penins., from the most *Chrysolina* subgenera and species. The similar shape of tibiae is also known in two unrelated species, namely *Ch.* (*Jeanclaudia) tibialis* and *Ch.* (*Chalcoidea) rufilabris*. *Ch. tibialis* and *Ch. rufilabris* both occur in eastern Siberia and differ from *Cecchiniola* in elytral punctures arranged in regular rows.

The present subgenus includes the one species, *Ch. platyscelidina* (Jacobson, 1898). It occurs in Crimea.



Cecchiniola **figure 1:** *Chrysolina platyscelidina*, female (Crimea: Simferopol): 1 – dorsal view, 2 – lateral view, 3–5 – tarsal sole: 3 – fore-tarsus, 4 – mid-tarsus, 5 – hind-tarsus, 6 – maxillary palpus, 7 – prosternum, 8 – prothoracic hypomeron. (Orig.)



***Cecchiniola* figure 2:** *Chrysolina platyscelidina*, male (Crimea: Simferopol): 1–3 – aedeagus: 1 – dorsal view, 2 – ventral view, 3 – lateral view; 4–6 – tarsal sole: 4 – fore-tarsus, 5 – mid-tarsus, 6 – hind-tarsus; 7 – fore tibia. (Orig.)

Subgenus *Centoptera* Motschulsky, 1860a

Diagnosis

Body convex, oval or elongate-oval.

Dorsum entirely metallic, elytra with differently colored spots.

Last maxillary palpomere 1.1–1.2 X longer than broad, as wide as penultimate palpomere, as long as the latter or 1.2 X shorter; similar in both sexes.

Antennae moderately broadened apically. Antennal insertion closer to clypeus than to eye.

Orbital line rather wide, deep, almost reaching antennal insertion in *Ch. bicolor* or ending far from antennal insertion in *Ch. metallica*.

Pronotum moderately or weakly convex (viewed from the front), broadest basally or near mid-length, with lateral sides arc-shaped or parallel in basal ½ and rounded in apical ½. Anterior side marginated, with dense setae. Anterior setiferous pore present in *Ch. bicolor*, absent in *Ch. metallica*. Pronotum laterally moderately or weakly swollen along entire length. Pronotal lateral impressions: broad, shallow to obsolete anteriorly, deepened posteriorly or very shallow along almost entire length, slightly deepened posteriorly. Prothoracic hypomeron convex, laterally with broad impression covered by transverse or irregular wrinkles. Basal fold strong.

Intercoxal prosternal process slightly broadened posteriorly, with shallow medial impression. Anterolateral portions of prosternum broad, weakly convex, margined by impressions anteriorly and posteriorly.

Metasternum marginated anteriorly between mid-coxae.

Elytron with weak humeral callus or without it at all. Elytral punctures very large, arranged in 10 regular, sparse rows (including abbreviated scutellar row). Rows 2–3, 4–5, 6–7, and 8–9 paired.

Epipleura inclined outside, visible along entire length in lateral view, densely ciliate posteriorly.

Hind wings developed, longer than elytra in *Ch. bicolor*, much reduced in *Ch. metallica*.

Last abdominal sternite evenly convex, apically rounded (female) or broadly truncate (male).

Tarsomeres 1–3 slightly broader in male than in female. Tarsomeres 1–3 entirely pubescent beneath in both sexes in *Ch. metallica*; or in male tarsomere 1 with glabrous stripe in basal ⅓–½ in all tarsi, tarsomere 2 with glabrous stripe along entire length in hind tarsi; in female tarsomeres 1 and 2 with broad glabrous stripe along entire length in all tarsi in *Ch. bicolor*. Claw tarsomere without denticles.

Pygidium bearing longitudinal furrow with vertical borders along entire length.

Aedeagus tube-shaped, moderately depressed dorso-ventrally, curved in lateral view, with apex simple, triangular or rounded, with weak apical denticles; flagellum simple, slightly exposed or not exposed.

Differential diagnosis

The subgenus *Centoptera* inhabiting Mediterranean basin and S Africa is close to subgenus *Ghesquiereita* distributed in C Africa, and differs in body less convex, more elongate, pronotum less convex (viewed from the front). *Centoptera* also resembles one species from the subgenus *Ovosoma*, namely *Ch. sahlbergii*, and differs in pronotal lateral impressions broad, shallow anteriorly, slightly deepened posteriorly, covered by very large, partly coalescent punctures along the entire length.

I include in this subgenus two species, one from Mediterranean area and another from S. Africa. Both species are morphologically rather close. Taxonomically related species are found in the Mediterranean region and S Africa in such beetle families as Tenebrionidae, Brachyceridae Kryzhanovsky (2002), Meloidae (Bologna, et al., 2008b).

Key to species

1(2) Pronotal lateral impressions shallow to obsolete anteriorly and moderately deep posteriorly. Hind wings developed, longer than elytra. In male, tarsomere 1 with glabrous stripe below in basal ⅓–½ in all tarsi, tarsomere 2 with glabrous stripe along entire length in hind tarsi. In female, tarsomeres 1 and 2 with broad glabrous stripe along entire length in all tarsi.

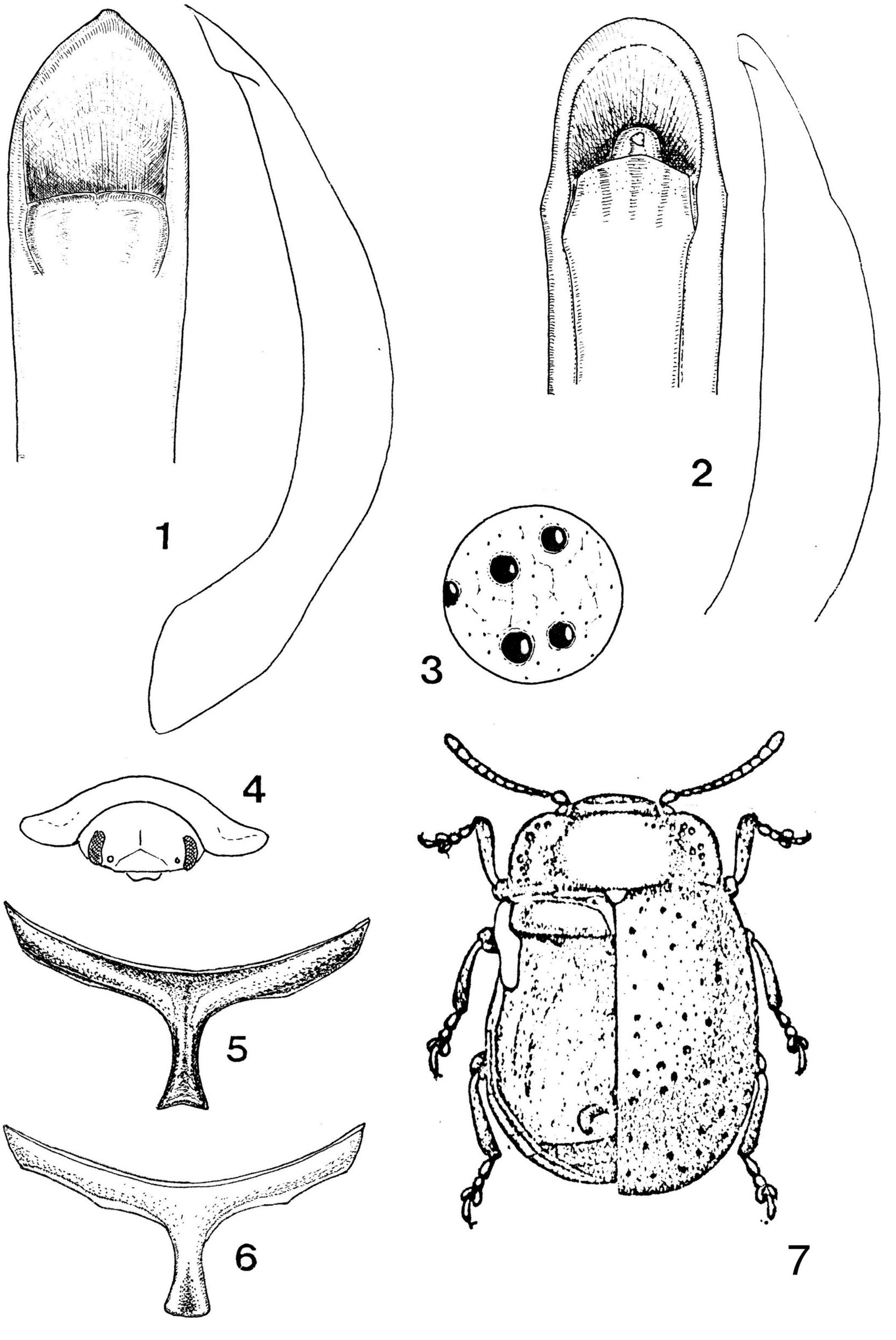
Coloration variable: 1) head, underside, legs, and elytral epipleura golden green, antennae bluish green or golden green, pronotum, scutellum, and elytra bronze, punctures in elytral rows broadly bordered by violet; 2) head, antennae, pronotal lateral calli, scutellum, and underside violet, pronotum (except lateral calli) and elytra bronze, punctures in elytral rows broadly bordered by violet with green margin, legs bluish black; 3) body including antennae and legs green, punctures in elytral rows broadly bordered by violet; 4) head, antennae, pronotal lateral calli, legs, and underside violet, scutellum blue or violet, pronotum (except lateral calli) green, elytra golden green, punctures in elytral rows broadly bordered by purple or violet; 5) head, antennae, pronotum, scutellum, legs, and underside violet, elytra including epipleura bluish green, punctures in elytral rows bordered by dark violet; 6) body completely black, with (or without) weak metallic shimmer. Length: 8.8–9.3 mm (males), 10.0–11.0 mm (females). Species from Mediterranean basin and Canary Isls. Figs. 1, 5.

Ch. bicolor (Fabricius, 1775)

2(1) Pronotal lateral impressions very shallow along almost entire length, slightly deepened basally. Hind wings very reduced. Tarsomeres 1–3 with entire sole in both sexes.

Head bronze or violet, pronotum, scutellum, and elytra bronze, underside, legs, elytral epipleura violet, antennae blue, and punctures in elytral rows black with narrow blue limb. Length: 8.1–10.4 mm (males); 9.3 mm (female, syntype). Species from S Africa. Figs. 2–4, 6, 7.

Ch. metallica (Degeer, 1778)



***Centoptera* figures 1–7:** 1 – *Chrysolina bicolor*, aedeagus, dorsal and lateral view (Syria); 2–4 – *Ch. metallica*: 2 – aedeagus, dorsal and lateral view, 3 – elytral puncturation, 4 – head and pronotum, frontal view; 5–6 – prosternum:

5 – *Ch. bicolor*, male (Syria), 6 – *Ch. metallica*, male; 7 – *Ch. metallica* (syntype, female), dorsal view. (After: Daccordi, 1982c: 7; others – orig.)

Subgenus *Chalcoidea* Motschulsky, 1860a

Diagnosis

Body elongate-oval or elongate-obovate, rarely broader, moderately or slightly convex.

Dorsum black or dark metallic (blue, bronze, green, violet), pronotum and elytra of the same color or slightly differently colored; mostly with rufous elytral lateral stripe, which rarely projects along elytral base; some species and subspecies with elytra entirely dark metallic or rufous.

Last maxillary palpomere parallel-sided or oval, beveled, similar (or almost so) to penultimate palpomere, longer than broad, similar in both sexes or slightly broader in male, than in female.

Antenna inserted at middle between clypeus and eye or closer to the former.

Pronotum more or less swollen laterally along entire length. Lateral impressions deep to shallow posteriorly, moderate to obsolete anteriorly, usually deeper posteriorly than anteriorly. Lateral impression covered by numerous punctures. Anterior side of pronotum marginated, with setae. Anterior setiferous pore present in most species, absent only in *Ch. besseri*, *Ch. taygetana*, and *Ch. turgaica.*

Prothoracic hypomeron convex, impressed along outside, basal fold present.

Metasternum entirely marginated anteriorly.

Elytron with humeral calli absent or present (weak to convex). Elytral puncturation arranged in rows, which are paired, or equidistant, regular or partly irregular. Intervals flat or slightly convex.

Epipleura inclined outside, visible along entire length in lateral view.

Hind wings differently developed: 1) absent, strongly reduced (very narrow, less than ½ elytral length), 2) slightly reduced (as long as elytra), or 3) normal, longer than elytra.

Pygidium with shallow to deep longitudinal furrow, at least, in basal ½.

Last abdominal sternite convex in both sexes, or impressed in male, apically rounded in both sexes, or in male broadly truncate or slightly bisinuate.

Tarsi with entire sole in both sexes, or with 1st tarsomere and sometimes 2nd tarsomere with glabrous stripe beneath (in all tarsi or in mid- and hind-tarsi only). In male fore- and mid-tarsomeres 1–3 slightly to strongly broadened, hind ones narrow or moderately broadened, in female tarsomeres 1–3 narrow;

or tarsomeres 1–3 narrow in both sexes. Claw tarsomere without denticles beneath.

Aedeagus flattened or oval in cross-section, thrice curved: firstly ventrally at middle of its length, secondly dorsally at level of apical opening, and thirdly ventrally at apex. The second and third curves are reduced in some species. Apex of aedeagus different: 1) "bottle shaped" with short or long apical projection, 2) abruptly truncate at the end, with short apical projection, 3) roundly, or almost rectilinearly narrowed at sides of apical opening, without detached apical projection. Flagellum mostly whip-shaped, rarely band-shaped with two longitudinal veins; projects beyond apical opening of aedeagus.

Differential diagnosis

Chalcoidea is peculiar because of the combination of mostly elongate body (in the species with developed hind wings), pale elytral lateral stripe (in most species and subspecies), last maxillary palpomere narrow, longer than wide, as wide as penultimate one, similar in both sexes, elytra with puncture rows, mostly paired, fore- and mid-tarsomeres 1–3 broadened in male (in most species), aedeagus thrice-curved and "bottle-shaped" (in most species), with long, narrow flagellum.

Some members of the subgenus *Ch.* (*Pezocrosita* Jacobson, 1901a) (*convexicollis*) group, namely *Ch. urjanchaica* (Jacobson, 1925), *Ch. ulugkhemica* Mikhailov, 2002, and *Ch. erzinica* Mikhailov, 2002 have aedeagus which resembles the aedeagus of the species of *Chalcoidea*. However, the above mentioned species differ from *Chalcoidea* in elytra unicolorous, and pronotum laterally with very convex, broad lateral calli along entire length, separated in basal ½ by very deep, narrow lateral impressions.

Key to species and subspecies

Species from different geographical regions are keyed separately:
A. Species from Europe and Palaearctic Asia.
B. Species from Africa.
C. Species from Oriental region.
D. Species from N America.

A. Species from Europe and Palaearctic Asia

(*Chrysolina marginata iniussa* is not included in the key because I have not specimens of this taxon at my disposal)

1(46) Hind wings developed or slightly reduced, at least reaching elytral apex.
2(21) Elytra unicolorous.
3(16) Elytra entirely dark metallic.

4(7) Species from W Europe.

5(6) Pronotal lateral impressions deep basally. Elytral puncture rows hardly visible among dense, confuse punctures in intervals, if rows rather distinct, then they consist of punctures very large, hollow-shaped. In male, fore- and mid-tarsi distinctly broadened. Aedeagus bottle-shaped, with long apical projection (Figs. 8: 5; 13: 5, 6; 19: 4). W Germany, France, Spain, Portugal, and former Yugoslavia. Length 6.0–6.9 mm (males), 6.8–8.2 mm (females).
Ch. carnifex (Fabricius, 1792)

5 subspecies are keyed in this couplet:

(a) subsp. *burdigalensis* Bechyné, 1949a. S-W France. According to the original description (Bechyné, 1949a), it is close to subsp. *coerulescens*, but body shorter, more convex, with pronotum slightly narrowed forward, strongly transverse, elytral rows with punctures larger, than those at pronotum laterally, dorsum entirely bluish black, without elytral lateral stripe, shining in both sexes. Figs. 8: 5; 19: 4.

(b) subsp. *coerulescens* (Suffrian, 1851), in part. C Germany. Elytral rows with punctures moderately large, similar to those at pronotal lateral impressions or slightly larger, rows hardly visible among dense fine punctures in intervals. Dorsum black with blue reflection, elytra without rufous lateral stripe. Aedeagus – fig. 13: 6.

(c) subsp. *cruentata* (Suffrian, 1851), in part. C, S, S-E Spain, Portugal, Italy (?). Elytral rows distinct, with punctures very large, foveiform. Intervals finely punctate. Dorsum bronze, bluish black, or blackish violet, with epipleura brown.

(d) subsp. *fossulata* (Suffrian, 1853). This subspecies was originally described from "Espagne". Later, it was found in Catalonia only (Warchałowski, 1993). I have not specimens from that area. The present subspecies is characterized by the elytral punctures very strong, partly hollow-like; dorsum entirely black, shining in male, dull in female.

(e) subsp. *melanaria* (Suffrian, 1851). Elytral rows with punctures moderately large, similar to those in pronotal lateral impressions or larger, rows hardly visible among dense fine punctures in intervals. Dorsum purely black or black with weak bronze reflection, elytra unicolorous or with rufous epipleura only. Aedeagus – fig. 13: 5.

6(5) Pronotal lateral impressions shallow basally, obsolete anteriorly, not forming furrow; impression filled by moderately large, numerous, dense punctures, partly coalescent. Elytral puncture rows consist of punctures fine to moderately large. Rows very distinct among fine punctures in intervals. Tarsi narrow in both sexes; in female, all tarsomeres 1 bear broad longitudinal glabrous stripe beneath in both sexes. Aedeagus with apical projection very short, broader than long (Figs. 2: 8; 3: 4). N, N-E, C, S Spain.

Dorsum moderately shining. Coloration varies: 1) body wholly dark bronze, 2) head and pronotum dark golden, elytra dark bronze, 3) head and pronotum dark bronze, elytra black with weak blue reflection; elytral epipleura and rarely lateral ½ of lateral elytral interval indistinctly paler: brown with bronze reflection, legs piceous, antennae brown with antennomeres 1 and 2 rufous. Length: 6.3–7.2 mm (male); 7.6–7.8 mm (female). Fig. 3: 1–7.

Ch. janbechynei Cobos, 1953

7(4) Species from S European Russia and Asia (including Caucasus).

8(9) Aedeagus rounded apically (Fig. 5: 9). Species from S European Russia: Krasnodar Krai: Taman, Stavropol Krai, and W Siberia: Omsk reg. Dorsum shining. Body bronze-black, with antennae brown, tarsi pale brown. Pygidium with distinct furrow along almost entire length. Female: last maxillary palpomere oval, as wide as penultimate one; tarsomeres 1-3 with entire sole. Length of elytra: 5.5 mm (male), 6.5 mm (female). Body length: 7.5–8.3 mm (female).

Ch. levi Okhrimenko, 1990

9(8) Aedeagus with narrow apical projection. Species from Kazakhstan, C Asia, N-W and W China, Siberia, and the Far East.

10(15) Aedeagus bottle-shaped apically. Larger species (length: 6.5–7.3 mm in males, 7.2–8.3 mm in females) from Kazakhstan, C Asia, N-W China, and S Siberia.

11(14) Aedeagus with apical projection long (Fig. 6: 2).

12(13) Body larger (length: 6.5–7.3 mm (males), 7.2–8.3 mm (females)). Aedeagus 2.5–3.0 mm long, 0.65 mm wide and wider. Apical projection of aedeagus almost parallel-sided, 0.26 mm wide and wider. Male fore-tarsomeres 1–3 at most 2.4 X as long as wide, with tarsomere 3 1.2–1.6 X as wide as long. Dorsum moderately shining. Body dark bronze, elytral epipleura brown with bronze reflection, 1–2 lateral intervals diffusely brown with bronze reflection, palpi and tarsi brown, antennae brown with antennomeres 1 and 2 rufous below. Fig. 14: 9. S Kazakhstan, Kyrghyzstan, N-W China.

Ch. immarginata (Rybakow, 1884)

13(12) Body smaller (length: 6.3 mm (male)). Aedeagus 2.1 mm long, 0.55 mm wide. Apical projection of aedeagus shorter and gradually narrowed towards apex, 0.2 mm wide. Male fore-tarsomeres 1–3 2.7 X as long as wide, with tarsomere 3 1.2 X as wide as long. Dorsum shining, black with bronze reflection. Maxillary palpi and tarsi blackish brown, antennae blackish brown with antennomeres 1 and 2 reddish. Fig. 19: 7. E Kazakhstan.

Ch. ivanovi Mikhailov, 2022

14(11) Aedeagus with apical projection short (Fig. 4: 2, 6). Dorsum shining. Body black with bronze reflection, elytra dark brown, laterally pale brown with bronze reflection, epipleura pale brown. Antennae brown with basal antennomeres paler. Length: 6.5 mm (male); 7.2 mm (female). Fig. 4: 1–6. S-W Kyrghyzstan, N-W China.

Ch. dieckmanni (Mohr, 1966a)

15(10) Aedeagus almost truncate apically, with very short apical projection (Fig. 5: 8). Smaller species (length: 4.5–5.2 mm in males, 5.7–6.0 mm in females) from N Asia.

Dorsum moderately or sericeous shining. Coloration of dorsum variable: 1) dark green with golden reflection, 2) entirely blackish blue, 3) blackish blue with pronotum (except lateral calli) violet, 4) head and pronotum dark green with golden reflection, elytra dark blue, 5) black with bronze reflection, 6) violet; antennae piceous with antennomere 1 yellow apically on underside, legs and ventral side of body piceous with weak metallic reflection.

Ch. instabilis (Mäklin, 1877), in part

16(3) Elytra rufous, unicolorous or with only suture dark metallic.

17(18) Elytral puncture rows hardly visible among dense, slightly wrinkled, confuse punctures in intervals. Fig. 6: 3. W Europe.

Ch. carnifex carnifex ab. *konowi* (Weise, 1889b)

18(17) Elytral puncture rows distinct.

19(20) All elytral intervals covered by fine punctures; punctures in broad intervals sometimes only slightly larger than those in narrow ones. Aedeagus bottle-shaped apically (Figs. 1: 1, 5; 2: 2).

Ch. marginata (Linnaeus, 1758)

Three subspecies are keyed here:

(a) subsp. *dierythra* (Rottenberg, 1871), in part. Sicily. Dorsum rather shining in both sexes, or moderately shining in female. Head, pronotum, and scutellum greenish golden black or dark blue, elytra pale rufous with only suture greenish black, or rufous with broad diffuse sutural marking greenish black, or yellow in lateral ½, rufous in rest part, with brown sutural interval. Pronotal lateral impression shallow in basal 1/5–¼, almost absent in anterior 4/5–¾. Elytral rows regular or slightly irregular, consist of punctures not very dense, unevenly placed (distance between many punctures in row larger than puncture diameter), intervals flat or very weakly convex, covered by dense fine punctures, which slightly larger on broad intervals than on narrow ones. Aedeagus with apical projection moderately short (as long as that in the nominotypical subspecies) (Fig. 2: 2). Length 6.0–6.5 mm (male), 6.5–7.0 mm (female).

(b) subsp. *marginata*, in part. Europe, Siberia. Dorsum entirely moderately shining (in male), or with elytra sericeous (in female). Head, pronotum, and scutellum dark bronze, elytra rufous with bronze reflection. Pronotal lateral impressions wide, shallow or moderately deep in basal ¼, very shallow or obsolete, wide in anterior ¾. Elytral rows regular, consist of moderately large punctures. Aedeagus with apical projection moderately long, longer than in subspecies *finitima* and distinctly shorter than in subspecies *waldheimi* and *sanguineocincta*. Length: 5.7–6.0 mm (male), 6.2–7.2 mm (female). Fig. 1: 5.

(c) subsp. *bodemeyeri* (Weise, 1910), in part. C Asia, Near East, Afghanistan. Dorsum moderately shining in both sexes, blackish blue, elytra brown with strong blue reflection, Pronotal lateral impression moderately deep in basal ¼, obsolete in anterior ¾. Elytral rows regular, consist of punctures placed at uneven distances and rather sparse (distance between punctures in row usually larger than puncture diameter), intervals flat, covered by very fine punctures. Aedeagus with apical projection as long as that in nominotypical subspecies or longer (Fig. 1: 1). Body large (length 7.0 mm in male, 6.6–7.6 mm in female). Fig. 1: 1–3.

20(19) All elytral intervals covered by very fine punctures; besides that, broad intervals covered by dense, moderately large punctures. Aedeagus triangular apically (Fig. 10: 7, 8; 19: 6). Head and pronotum moderately shining, bluish black, elytra dull or shining, rufous with obsolete darkening at disc. Length: 6.5 mm (male), 7.3–8.1 mm (females). Turkey.

Ch. sellata (Weise, 1894a), in part

21(2) Elytra laterally paler than at disc, mostly with distinct lateral stripe.

22(29) Elytral rufous lateral stripe extending along elytral base and mostly reaching scutellum.

23(24) Pronotum with lateral sides almost rectilinearly convergent from base to apex (Fig. 11: 1). Aedeagus rounded apically (Fig. 11: 2, 6). Species from Central Kazakhstan.

Dorsum shining. Body black, dorsum bluish black, elytra with epipleura (with interior border darkened), broad basal and lateral stripes (reaching 8th puncture row) red; palpi and antennae piceous brown, antennomeres 1 and 2 partly, apices of mandibles, prothoracic hypomeron anteriorly, pygidium, abdominal sternites 4 and 5 apically rufous. Length: 6.4 mm (male). Fig. 11: 1–6.

Ch. turgaica (Jacobson, 1910a)

24(23) Pronotum with lateral sides distinctly rounded. Aedeagus bottle-shaped or triangular apically.

25(26) Basal elytral stripe narrow laterally and broadened towards suture to include scutellum. Aedeagus elongate-triangular apically (Fig. 5: 5). In female, tarsomere 1 of all tarsi with broad glabrous stripe beneath (Fig. 18: 11).

Dorsum moderately or sericeous shining. Head and pronotum dark green, dark blue, dark violet, or dark bronze, elytra dark bronze or dark brassy, with rufous lateral stripe extending along base and reaching scutellum, rufous stripe at elytral base with diffuse inner border; antennae, palpi, legs, and underside pitchy black with metallic reflection, antennomeres 1 and 2 rufous below, pygidium rufous, darkened apically. Length: 6.1–6.8 mm (males), 6.6–7.7 mm (females). Hungary, Ukraine, S European Russia, Azerbaijan, Kazakhstan, Kyrghyzstan.

Ch. besseri (Krynicki, 1832)

26(25) Basal elytral stripe broad. In female, tarsomere 1 of all tarsi entirely pubescent or with very narrow glabrous stripe beneath.

27(28) Dorsum moderately shining. Elytral rows with large punctures. Aedeagus triangular apically (Fig. 10: 7, 8; 19: 6). Species from Turkey.

Coloration varies: 1) head, pronotum, and scutellum bluish black, antennae, legs and underside dark brown with blue reflection, elytra brown with blue reflection and rufous basal and lateral band, lateral band broad, reaching ½ interval between 7 and 8 rows, rufous band sometimes projecting from the elytral apex forward along suture, suture black; 2) head, pronotum, legs, and underside bluish black, antennae bluish black with underside of antennomeres 1 and 2 rufous, elytra black with basal and lateral bands rufous, lateral band almost reaching 7th puncture row. Length: 6.5 mm (male), 7.3–8.1 mm (females). Fig. 10: 1–12.

Ch. sellata (Weise, 1894a), in part

28(27) Dorsum dull. Elytral rows with punctures moderate or fine. Aedeagus bottle-shaped apically (Fig. 5: 3). Endemic species of N-W Caucasus: Lagonaki plateau.

Head, pronotum, and elytra bluish black, or head and pronotum bronze-black; elytra with broad rufous basal and lateral stripes, lateral stripe reaching 6th or 7th puncture row, inner border of this stripe diffuse, especially in basal part, underside, femora, and tibiae black with weak metallic reflection, tarsi piceous, antennae brown with antennomeres 1 and 2 rufous below, pygidium black. Length: 6.1 mm (male), 6.9 mm (female). Figs. 5: 3; 14: 6; 18: 4.

Ch. zamotajlovi L.Medvedev et Okhrimenko, 1991

29(22) Elytra with rufous (red) lateral stripe not extending along base.

30(31) In male, all tarsomeres 1 with broad glabrous stripe along entire length beneath (Fig. 18: 9); in female, all tarsomeres 1–3 with broad glabrous stripe beneath (Fig. 18: 10). Dorsum moderately shining. Body including legs black with bronze reflection, elytra with red lateral stripe reaching 9th puncture row or ½ distance between 8th and 9th rows, tarsi piceous, antennae piceous with antennomeres 1 and 2 rufous below. Length: 7.3–8.4 mm (males), 8.4–9.5 mm (females). Figs. 5: 6; 8: 3. C Asia, Iran, Afghanistan.

Ch. lia (Jacobson, 1895)

31(30) In male, tarsomeres 1–3 with entire sole or, at most, with very narrow sparsely pubescent or glabrous stripe beneath.

32(33) Pronotum without lateral impressions, disc smooth, impunctate. Head and pronotum smooth, obsoletely shagreened, with clypeus distinctly shagreened, and sparsely punctulate, scutellum smooth, obsoletely shagreened, elytra sericeous shining, distinctly shagreened. Dorsum black, blackish bronze, blackish blue, blackish violet, or dark green with bronze reflection, or head and pronotum blackish blue, elytra blackish violet. Elytra with rufous epipleura and lateral stripe reaching 9th puncture row or slightly extending beyond this row, rarely rufous stripe occupies only lateral ⅓ of the 10th interval. Antennae brown with antennomeres 1–3 mostly rufous. Legs blackish brown with metallic reflection. Underside black with blue or bronze reflection. Pygidium yellow. Length: 3.5–5.1 mm (males), 5.2–6.5 mm (females). Fig. 5: 2. Europe, Algeria, N Caucasus.

Ch. analis (Linnaeus, 1767)

33(32) Pronotum with distinct lateral impressions, at least basally, disc with dense punctures.

34(35) Elytral puncture rows indistinct among rather coarse puncturation of intervals. Pygidium rufous with apical margin black. Aedeagus bottle-shaped (Fig. 5: 1). Length: 6.0–6.9 mm (males), 6.8–8.2 mm (females).
Ch. carnifex (Fabricius, 1792)

Three subspecies are keyed here:

(a) subsp. *carnifex*. C, E Europe, N Kazakhstan, south of W Siberia. Dorsum moderately or sericeous shining, black with weak bronze tint, rarely with weak blue tint, elytra with rufous lateral stripe extending beyond 8th or reaching 7th row of punctures. Elytron with regular rows of sparse large punctures; rows indistinct among rather coarse, moderately large punctures mixed with fine punctures in intervals. Figs. 5: 1; 14: 5.

b) subsp. *coerulescens* (Suffrian, 1851), in part. C Germany. Dorsum black with blue reflection, elytra with rufous lateral stripe. Elytral rows with punctures moderately large, similar to those at pronotal lateral impressions or slightly larger, rows hardly visible among dense fine punctures in intervals.

c) *cruentata* (Suffrian, 1851), in part. C, S, S-E Spain, Portugal, Italy (?). Dorsum bronze, bluish black, or blackish violet, with rufous elytral lateral stripe. Elytral rows distinct, with punctures very large, foveiform. Intervals finely punctate.

35(34) Elytral puncture rows more distinct (compare with couplet 34 c – *Ch. carnifex cruentata*). Pygidium black throughout.

36(39) Pronotum with moderately deep, narrow lateral impressions near base. Aedeagus with apex triangular or rounded. In female, tarsomere 1 with broad glabrous stripe beneath.

37(38) Aedeagus with apex triangular (Figs. 5: 4; 9: 1). Species from S-E European Russia, Turkey, Caucasus, Kazakhstan, and N-W Iran.

Dorsum moderately shining, in female sometimes sericeous shining. Coloration varies: 1) body greenish black or black with brassy or bronze reflection, elytra pitchy brown with brassy or bronze reflection in some specimens, elytral epipleura and lateral stripe covering 9th puncture row rufous, 2) body bluish black with only epipleura and spot on lateral interval near apex rufous (in one female from Sultan Dagh); legs black with metallic reflection, antennae brown with antennomeres 1 and 2 rufous below. Length: 6.8–8.4 mm (male), 7.2–8.5 mm (female). Figs. 5: 4; 9: 1–10; 18: 6.
Ch. songarica (Gebler, 1843)

38(37) Aedeagus with apex rounded (Fig. 8: 1, 2). Species from S-E Kazakhstan.

Dorsum weakly shining or dull, black with weak blue reflection, elytra with rufous lateral stripe reaching 8th puncture row, underside and legs black or piceous, antennae piceous with antennomeres 1 and 2 yellow below. Length: 6.3 mm (male), 6.5–7.5 mm (females).

Ch. lehri (Lopatin, 1970b)

39(36) Pronotum with shallow lateral impressions near base. Aedeagus with narrow apical projection. In female, tarsomere 1 with entire sole, or with sparsely pubescent longitudinal stripe, or with very narrow glabrous longitudinal stripe basally.

40(43) Prosternal process with medial longitudinal ridge along entire length (Fig. 14: 7). Aedeagus apically truncate and bearing short and narrow apical projection (Figs. 5: 10; 7: 6, 7; 8: 4; 18: 1, 2; 19: 1, 2, 5).

41(42) Elytral rows with punctures large, hollow-shaped. Pronotal lateral impressions distinct along entire length, moderately deep basally. Species from Spain, Italy, and France.

Ch. interstincta (Suffrian, 1851)

Three subspecies are keyed here:

(a) subsp. *interstincta*. Italy. Body including legs dark blue with elytra violet, elytral lateral stripe extending through 8th puncture row rufous; antennae piceous with antennomeres 1 and 2 yellow below. Elytron with partly irregular rows of dense, large punctures. Rows hardly visible because of dense, moderately large, confuse punctures in intervals between rows 3 and 4, 5 and 6, 7 and 8. Intervals flat. It is close to the subsp. *subseriata* and differs in puncturation in elytral intervals sparser. Length 7.0–7.5 mm. Fig. 19: 5.

(b) subsp. *graellsii* (Perez Arcas, 1872). Portugal, Spain. Body smaller, than in subspecies *subseriata*, 5.5–7.0 mm long, dorsum mostly bronze or with elytra brown with bronze reflection, rarely black with blue reflection, with rufous lateral stripe reaching 7th–9th puncture row, elytral rows with punctures very large, foveiform, rows distinct because of punctures in intervals fine. Figs. 18: 2; 19: 2.

(c) subsp. *depressa* (Suffrian, 1854). C, S France. Body including legs dark blue, rarely with elytra violet or black, elytral lateral stripe reaching 8th–9th puncture row rufous; antennae piceous with antennomeres 1 and 2 yellow below. Elytron with regular or partly irregular rows of dense, large punctures. Rows hardly visible because of very dense, moderately large, confuse punctures in intervals between rows 3 and 4, 5 and 6, 7 and 8. Intervals slightly wrinkled, sometimes intervals between rows 2 and 3 as well as between 4 and 5 slightly convex. Length: 6.7–7.0 mm (males), 7.6–8.1 mm (females). Figs. 5: 10; 14: 7; 18: 1; 19: 1.

42(41) Elytral rows with punctures fine. Pronotal lateral impressions develop only near base, very shallow. Species from Caucasus, Iran, N-E Turkey, and W Turkmenistan.

Ch. tesari (Roubal, 1936)

Two subspecies:

(a) subsp. *tesari*. Caucasus, N-E Turkey. It differs from subspecies *elbursica* in the smaller body and in elytral rufous lateral stripe broader, reaching 7th or 8th puncture row. Dorsum black with blue or bronze reflection, or dark brassy, or dark greenish blue. Length: 5.9–6.0 mm (males), 6.5–7.2 mm (females). Figs. 7: 7; 8: 4.

(b) subsp. *elbursica* Lopatin, 1981. N Iran, Turkmenistan. It differs from the nominotypical one only in the larger body (length 7.8–7.9 mm in male, 7.7–8.0 mm in female), and in elytra bearing narrower rufous lateral stripe (reaching 8th or 9th puncture row). Dorsum blackish bronze. Aedeagus (Fig. 7: 6) as in the nominotypical subspecies.

43(40) Prosternal process without medial longitudinal ridge or with ridge in posterior ½ only.

44(45) In male, fore and mid tarsomeres 1–3 broadened (Fig. 18: 8). Aedeagus with apical projection, at least, longer than wide, up to very long (Figs. 1: 1, 4–6; 2: 1, 3–7; 18: 5; 19: 3). *Ch. marginata* (Linnaeus, 1758)

Six subspecies are keyed here:

(a) subsp. *marginata*, in part. Europe, Siberia. Dorsum entirely moderately shining (in male), or with elytra sericeous (in female). Head, pronotum, and scutellum dark bronze, elytra bronze with rufous (yellow) lateral stripe. Pronotal lateral impressions wide, shallow or moderately deep in basal ¼, very shallow or obsolete, wide in anterior ¾. Elytral rows regular, consist of moderately large punctures. Aedeagus with apical projection moderately long, longer than in subspecies *finitima* and distinctly shorter than in subspecies *waldheimi* and *sanguineocincta*. Length: 5.7–6.0 mm (male), 6.2–7.2 mm (female). Figs. 1: 5; 2: 1, 6, 7; 18: 3, 5; 19: 3.

(b) subsp. *bodemeyeri* (Weise, 1910), in part. Majorca Isl., C Asia, Near East, Afghanistan. Dorsum moderately shining in both sexes, blackish blue, rarely dark bronze, rufous elytral lateral stripe reaching 7th or 8th puncture row. Pronotal lateral impression moderately deep in basal ¼, obsolete in anterior ¾. Elytral rows regular, consist of punctures placed at uneven distances and rather sparse (distance between punctures in row usually larger than puncture diameter), intervals flat, covered by very fine punctures. Aedeagus with apical projection as long as that in nominotypical subspecies or longer. Body large (length 7.0 mm in male, 6.6–7.6 mm in female). Fig. 1: 1–3.

(c) subsp. *waldheimi* Kippenberg, 2010. Siberia, S Kazakhstan, C Asia, N-W China, N Mongolia. Dorsum moderately shining in male, wholly sericeous or with head and pronotum moderately shining in female, dark bronze or with elytra bronze-brown, rufous elytral lateral stripe distinct, reaching 9th or 8th puncture row. Pronotal lateral impression shallow in basal ¼, obsolete or absent in anterior ¾. Elytral rows regular, consist of punctures unevenly placed, dense (distance between punctures in row mostly as large as puncture diameter), in male broad intervals between paired rows flat, covered by dense punctures as large as those at pronotal disc, narrow intervals between rows of each pair slightly convex, very finely punctate; in female broad intervals between paired row convex, narrow intervals between rows of each pair slightly keel-shaped, all intervals covered by very fine punctures. Aedeagus gradually narrowed at sides of apical opening, with apical projection distinctly longer than that in the nominotypical subspecies (Figs. 1: 4; 2: 5). Length 5.7–6.7 mm (male), 6.7–7.6 mm (female).

(d) subsp. *finitima* Brown, 1962. N Eurasia. Dorsum moderately shining in both sexes, dark bronze, rarely with weak bluish reflection, rufous elytral lateral stripe usually diffuse, rarely distinct, reaching 9th or 8th puncture row. Pronotal lateral impression shallow or moderately deep in basal ¼–⅓, obsolete in anterior ⅔–¾. Elytral rows regular, or undulate, or slightly irregular, consist of punctures very dense (distance between punctures in row usually smaller than puncture diameter), intervals between rows of each pair slightly convex, others flat, covered by dense fine punctures, which larger on broad intervals than on narrow ones. Aedeagus with apical projection shorter than that in the nominotypical subspecies (Figs. 1: 6; 18: 8). Body small (length 4.7–5.9 mm in male, 5.6–6.6 mm in female).

(e) subsp. *sanguineocincta* (Crotch, 1872). Sinai, Jordan. Dorsum moderately shining in both sexes, entirely blackish blue or with elytra brown with strong blue reflection, rufous elytral lateral stripe reaching 7th puncture row or ½ distance between 7th and 8th rows. Pronotal lateral impression shallow, wide in basal ¼, obsolete in anterior ¾. Elytral rows regular, consist of punctures placed at uneven distances, which usually as large as diameter of the punctures or slightly larger. Intervals between rows 2–3, 4–5 (and 6–7 in female) slightly convex, others flat; narrow intervals (between rows forming each pair) look like impunctate (very finely sparsely punctate), broad intervals (between pairs of rows) covered by dense moderately large punctures which larger than those at pronotal disc. Aedeagus with apical projection longer than that in nominotypical subspecies (Fig. 2: 3). Body large (length 7.0 mm in male, 7.6 mm in female).

(f) subsp. *glacialis* (Weise, 1884a). Alps. Dorsum moderately shining in both sexes, dark bronze, rufous elytral lateral stripe usually with diffuse interior border, reaching 9th or 8th puncture row. Pronotal lateral impression wide, shallow in basal ⅓–¼, obsolete in anterior ⅔ or ¾. Elytral rows regular, rarely slightly irregular, consist of punctures dense, unevenly placed (distance between punctures in row usually as wide as puncture diameter or narrower), intervals flat or some intervals between rows forming each pair very slightly convex; intervals covered by dense fine punctures, which larger on broad intervals than on narrow ones; interval punctures usually connected by very fine "scratches". Aedeagus with apical projection moderately short (as long as that in the nominotypical subspecies) (Fig. 2: 4). Body small (length 5.2–6.0 mm in male, 5.7–6.2 mm in female).

(g) subsp. *dierythra* (Rottenberg, 1871), in part. Sicily. Dorsum rather shining in both sexes, or moderately shining in female. Head, pronotum, and scutellum greenish black or dark blue, elytra dark blue or blackish green with rufous lateral band, almost reaching 3rd puncture row from the lateral side (ab. *convexior*). Pronotal lateral impression shallow in basal

1/5–¼, almost absent in anterior 4/5–¾. Elytral rows regular or slightly irregular, consist of punctures not very dense, unevenly placed (distance between many punctures in row larger than puncture diameter), intervals flat or very weakly convex, covered by dense fine punctures, which slightly larger on broad intervals than on narrow ones. Aedeagus with apical projection moderately short (as long as that in the nominotypical subspecies) (Fig. 2: 2). Length 6.0–6.5 mm (male), 6.5–7.0 mm (female).

45(44) In male, tarsomeres 1–3 narrow (Fig. 18: 7). Aedeagus with apical projection very short, not longer than wide (Fig. 5: 8).

Dorsum moderately or sericeous shining; violet; antennae piceous with antennomere 1 yellow apically on underside, legs and ventral side of body piceous with weak metallic reflection. Elytral epipleura and lateral stripe reaching 8th or 9th puncture row, or epipleura and diffuse lateral stripe on lateral interval, or epipleura only, rufous. Length: 4.5–5.2 mm (males), 5.7–6.0 mm (females). N Asia.

Ch. instabilis (Mäklin, 1877), in part

46(1) Hind wings absent or strongly reduced, very narrow and not longer than ½ of elytral length.

47(48) Tibiae angularly dilated apically on external side (Fig. 14: 10). Hind wings very narrow, as long as ⅓ elytral length.

Dorsum moderately shining, with scutellum smooth, very shining. Dorsum dark bronze, underside dark bronze or brown with bronze reflection, last abdominal sternite and pygidium reddish, clypeus, mandibles, maxillary palpi, legs, and antennae rufous. Length: 5.5–6.4 mm (male); 6.4–6.6 mm (female). Aedeagus – fig. 13: 4. E Siberia, Mongolia.

Ch. rufilabris (Faldermann, 1835)

48(47) Tibiae simple, not angularly dilated apically.

49(58) Elytral intervals covered by distinct, dense, fine punctures. Hind wings absent or very reduced. Species from Siberia, the Far East, Mongolia, and N-W China.

50(57) Dorsum entirely metallic.

51(56) Aedeagus apically obtusely rounded with distinct, short projection (Figs. 13: 1, 2; 14: 3).

52(53) Aedeagus longer (1.8 mm long, fig. 14: 3). Elytral sutural stria almost absent, very weakly impressed and very short. Dorsum moderately shining, with scutellum shining. Dorsum dark bronze with greenish tint, underside, elytral epipleura, femora, and tibiae brown with greenish bronze reflection, antennae and tarsi brown, antennomeres 1 and 2 yellow below. Length: 5.5 mm (male), 6.3 mm (female). Tuva.

Ch. sajanica (Jacobson, 1925)

53(52) Aedeagus shorter (1.3–1.5 mm long). Elytral sutural stria distinct at apical slope.

54(55) Aedeagus with apical projection longer and less separated from apical margin (Fig. 13: 2). Dorsum sericeous shining. Dorsum dark bronze or black with weak metallic reflection, underside, clypeus, maxillary palpi, and legs piceous with bronze reflection, antennae rufous or light brown. Length: 4.4–5.8 mm (male), 6.5 mm (female). Fig. 18: 12. S Siberia, N, C Mongolia.

Ch. lopatini (Mohr, 1966a)

55(54) Aedeagus with apical projection shorter and more separated from apical margin (Fig. 13: 1). Dorsum moderately shining, with pronotum or elytra sericeous shining in some specimens. Dorsum dark bronze, dark coppery, or black with blue or violet reflection, underside, clypeus, maxillary palpi, and legs piceous with bronze reflection or dark bronze, antennae piceous with antennomeres 1 and 2 rufous below. Length: 5.0–5.6 mm. South of E Siberia, Mongolia.

Ch. pusa (Lopatin, 1962)

56(51) Aedeagus more or less triangularly narrowed apically (Fig. 13: 3, 7).

Ch. brunnicornis (Weise, 1887a)

Three subspecies:

(a) subsp. *brunnicornis*. Tuva, W Mongolia. Pronotum broadest behind mid-length, with lateral sides slightly arc-shaped. Pronotum laterally moderately swollen along entire length. Pronotal lateral impressions wide, shallow in basal ⅓, obsolete anteriorly. Elytral intervals flat. Length: 4.7 mm (male), 5.2 mm (female). Aedeagus – fig. 13: 7.

(b) subsp. *bermani* L.Medvedev, 1978. Yakutia, Chita reg. It differs from nominotypical subspecies in pronotum broadest before mid-length, with lateral sides more convex, in pronotal lateral calli broader, separated from disc by deeper impressions basally, and in elytral intervals slightly convex. Length: 5.1–6.1 mm (males), 6.1–7.2 mm (females). Aedeagus – fig. 13: 3.

(c) subsp. *vrangeliani* Voronova, 1985. Wrangel Isl. It is close to subspecies *bermani* in the shape of pronotum and elytral relief. It differs from both, the nominotypical subspecies and subspecies *bermani* in dorsum black, with or without weak bronze reflection, in elytral rows more distinct, consist of moderately large punctures. Length: 5.1–5.2 mm (males), 5.9–6.1 mm (females).

57(50) Dorsum metallic with elytral rufous lateral stripe. Pronotum basally with shallow lateral impressions. Hind wings very narrow, as long as ½ elytral length. Aedeagus apically "bottle-shaped" with narrow apical projection (Figs. 14: 1, 2; 17: 1, 5–7). Species from N-W and W China.

Dorsum moderately shining, with elytra sericeous; dark bronze, with legs and underside black with bronze reflection, elytral epipleura and lateral ⅓ of the extreme lateral interval rufous, with diffuse border between rufous and bronze parts. Antennae piceous, with antennomeres 1 and 2 yellow below. Male tarsomeres 1–3 entirely pubescent beneath, female tarsomere 1 with narrow glabrous stripe beneath. Length: 5.0–6.8 mm. Figs. 14: 1, 2; 17: 1–7.

Ch. zangana Chen et Wang in: Wang, Chen, 1981

58(49) Elytral intervals impunctate or covered by very fine punctures, look like impunctate. Hind wings very narrow, as long as ½ elytral length.

Pronotum with deep, narrow, furrow-shaped lateral impressions in basal ⅓. Aedeagus apically rounded (Fig. 15: 1). Species from Greece.

Dorsum sericeous, or with head and pronotum moderately shining. Body including legs dark bronze or black with bronze reflection, elytron with rufous epipleura, narrow basal band and lateral band reaching row 9 or ½ distance between rows 8 and 9 laterally. Maxillary palpi and antennae piceous, antennomeres 1 and 2 yellow below. Length: 6.1–7.1 mm (males), 6.2–7.5 mm (female). Fig. 15: 1–5.
Ch. taygetana Bechyné, 1952a

B. Key to species from Africa

(*Chrysolina marginata luteocincta* and *Ch. superstes siruense* are not included in the key because of unclear taxonomical position)

1(6) Elytra with distinct puncture rows among fine puncturation of intervals.

2(3) Pronotum without lateral impressions, disc smooth, impunctate. Body dark blue, elytra with rufous lateral stripe. Aedeagus bottle-shaped, with short apical projection. European species, found also in Algeria. Length: 3.5–5.1 mm (males), 5.2–6.5 mm (females).
Ch. analis (Linnaeus, 1767)

3(2) Pronotum with lateral impressions deepened basally, disc distinctly punctate.

4(5) Body broadly oval, convex. Dorsum shining. Aedeagus apically broadly rounded and bearing narrow and short apical projection. Aedeagus with apical opening almost covered by lobe, flagellum narrow (Fig. 2: 9; 6; 4). In male tarsomeres 1–3 narrow, only slightly broadened in fore tarsi, all tarsomeres 1 with broad glabrous stripe not reaching the apex beneath; in female all tarsomeres 1 with broad glabrous stripe along entire length beneath. Species from Tunisia, Algeria, and Morocco.

Head, pronotum, and elytra dark bronze, or elytra brown with bronze reflection; elytra with rufous epipleura and lateral stripe reaching 8th or 9th puncture row, this stripe with inner border diffuse; antennae with 2–6 basal antennomeres rufous, others piceous; legs and underside black or piceous, with blue or brassy reflection. Length: 5.8–6.6 mm (males), 6.7–7.2 mm (females). Figs. 2: 9, 10; 6: 4. There are two subspecies.
Ch. vagecincta (Fairmaire, 1875)

5(4) Body elongate-oval, weakly or moderately convex. Dorsum moderately shining or dull, dark metallic, with or without rufous lateral stripe. In male tarsomeres 1–3 with entire sole, fore and mid tarsomeres 1–3 very broad, hind ones moderately broad; in female all tarsomeres 1 with narrow glabrous stripe in basal ½ or along almost entire length and not reaching the apex. Aedeagus weakly and almost rectilinearly narrowed towards apex (Fig. 6: 1).
Ch. superstes (Bedel, 1921)

Two subspecies are keyed here:

(a) subsp. *superstes*. Morocco. Dorsum sericeous shining or dull. Elytral puncture rows consist of punctures larger (sometimes foveiform in rows 3–7) and sparser than in subspecies *roulleaui*; intervals covered by sparse punctures. Length: 7.3–7.6 mm (males), 7.7–8.4 mm (females). Figs. 11: 7–10; 14: 8.

(b) subsp. *roulleaui* (Kocher, 1958). Morocco. Dorsum dark bronze, moderately shining, without rufous elytral stripe, elytral rows with punctures rather fine and denser, than in nominotypical subspecies, intervals with dense punctures. According to Kocher (1958), the female's body is shining in the subspecies *roulleaui*, whereas it is dull in the nominotypical subspecies.

6(1) Elytral rows with punctures large, foveiform, but not very distinct because of moderately large punctures in intervals. Body very convex, entirely metallic, moderately shining, dark blue or with head and pronotum black with weak violet reflection. Tarsomeres 1–3 with entire sole in both sexes. Aedeagus bottle-shaped, with long apical projection (Fig. 8: 6). Length 7.1–8.8 mm (males), 7.9–9.8 mm (females). Algeria.

Ch. carnifex hollandei (Bourdonné, 2012)

C. Key to species from Oriental region

1(2) Hind wings very reduced, not longer than metathorax. In male, tarsomeres 1–3 narrow. Aedeagus with narrow apical projection (Figs. 5: 7; 16: 1).

Dorsum moderately shining. Body dark bronze, antennae and legs dark brown with bronze reflection, elytral epipleura and lateral stripe occupying intervals 9 and 10 dark reddish, with diffuse border between rufous and bronze parts of elytron. Antennomeres 1 and 2 rufous below apically. Length 7.2–7.4 mm (male), 8.0–9.0 mm (female). Figs. 5: 7; 16: 1–6. N India.

Ch. brahma Takizawa, 1980

2(1) Hind wings developed, longer than elytra. Aedeagus triangular apically (Fig. 12: 3, 5, 6).

3(4) Elytra brown with bronze reflection, with only epipleura yellow. Elytral punctures coarse, mostly foveiform. Aedeagus as in Fig. 12: 3.

Head and pronotum moderately shining, elytra weakly shining. Head and pronotum dark bronze, scutellum, legs and underside black with golden reflection, antennae piceous with antennomeres 1 and 2 yellow below. Length 8.0–9.3 mm. Fig. 12: 1–4. E India.

Ch. manipurensis Maulik, 1926

4(3) Elytra with rufous lateral stripe reaching 8th or 9th puncture row. Elytral punctures moderately large. In male, tarsomeres 1–3 broad. Aedeagus as in Fig. 12: 5, 6.

Dorsum entirely rather shining or moderately shining, or with elytra sericeous shining. Body dark bronze or dark brassy, underside with greenish reflection, elytra sometimes brown with strong bronze reflection. Antennae black with antennomeres 1–3 yellow on underside, last abdominal sternite sometimes reddish apically. Length: 7.1–8.0 mm (males), 8.0–8.4 mm (females). N, E India, Nepal, Myanmar, N Vietnam, Bhutan.

Ch. vishnu (Hope, 1831)

D. Key to species from N America

1(4) Body mostly larger (5.6–7.0 mm long). Species occurring from central Alberta southward.

2(3) Aedeagus apically narrowly drawn out (Fig. 7: 1, 2). Species occurring from S Canada to S USA, but not found in California.

Dorsum moderately or sericeous shining, black, sometimes with bronze or blue reflection; antennae, legs, and underside piceous, antennomeres 1 and 2 rufous below. Elytral epipleura and distinct lateral stripe projecting beyond 8th puncture row or only lateral interval diffusely rufous. Length: 5.6–6.4 mm (males), 6.2–7.0 mm (females).

Ch. flavomarginata (Say, 1824)

3(2) Aedeagus apically broadly truncate and bearing narrow apical projection (Fig. 7: 8). Species from California.

Entirely black except the elytral margins; elytra with a very faint greenish or bluish luster and therefore contrasting slightly with pronotum, with epipleura and 1.5 outermost lateral intervals reddish-yellow. Length: 6.1–6.6 mm.

Ch. extorris Brown, 1962

4(1) Body mostly smaller (4.2–6.2 mm long). Arctic and subarctic species.

5(6) Elytral puncture rows regular or slightly undulate. Fore tarsomeres 1–3 rather broadened in male. In female, elytral intervals weakly convex. Aedeagus with apical projection longer than in the next species (Fig. 1:7).

Dorsum moderately shining, dark bronze, rarely with weak bluish reflection, rufous elytral lateral stripe usually diffuse, rarely distinct, reaching 9th or 8th puncture row, rarely elytra pale brown margined with rufous laterally. Pronotal lateral impression shallow or moderately deep in basal ¼–⅓, obsolete in anterior ⅔–¾. Elytral rows consist of punctures very dense, intervals between rows of each pair slightly convex, others flat, covered by dense fine punctures, which larger on broad intervals than on narrow ones. Length: 4.7–5.9 mm (male), 5.6–6.6 mm (female). Arctic Alaska.

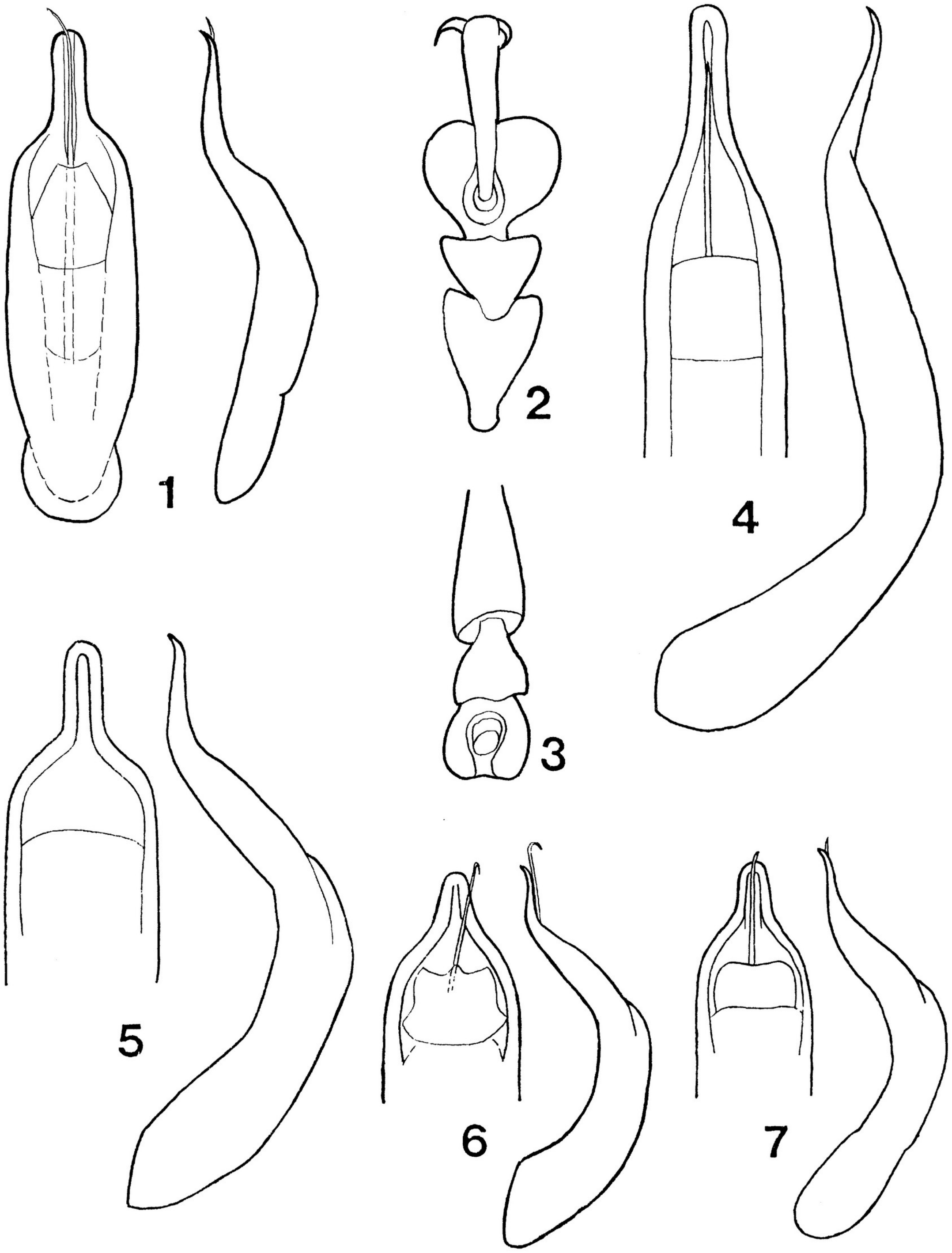
Ch. marginata finitima Brown, 1962

6(5) Elytral puncture rows mostly confuse. Fore tarsomeres 1–3 slightly broader in male than in female. Elytral intervals flat in both sexes. Aedeagus with apical projection shorter than in the previous species (Fig. 7: 3).

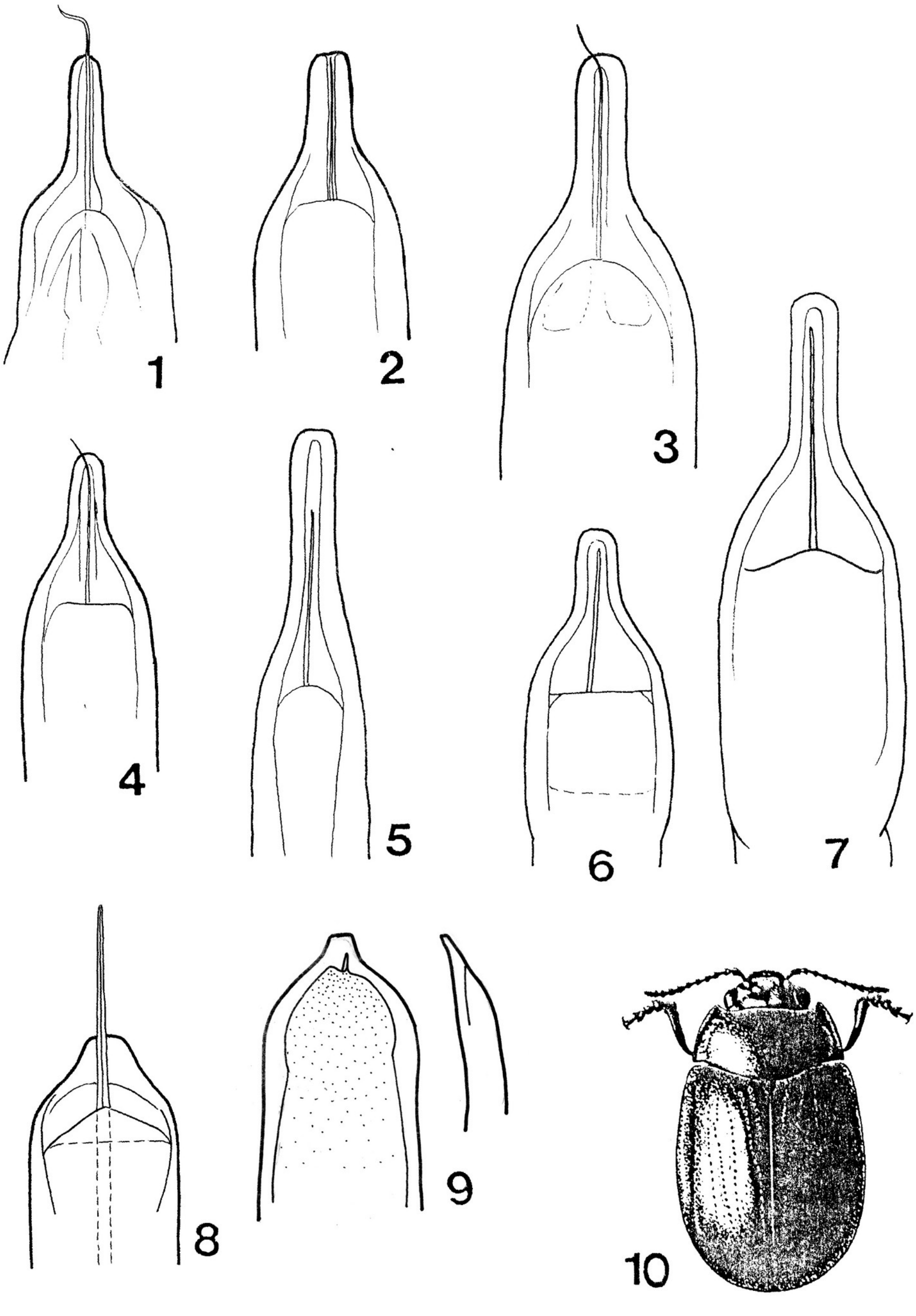
Dorsum moderately or sericeous shining; dark bronze, or with elytra brown with bronze reflection, elytral epipleura and lateral stripe reaching 8th or 9th puncture row rufous, antennae brown with antennomeres 1 and 2 yellow below, underside, legs, and palpi piceous. Length: 5.1–5.7

mm (males), 5.3–5.5 mm (females). Figs. 7: 3–5; 14: 4. North of N America.

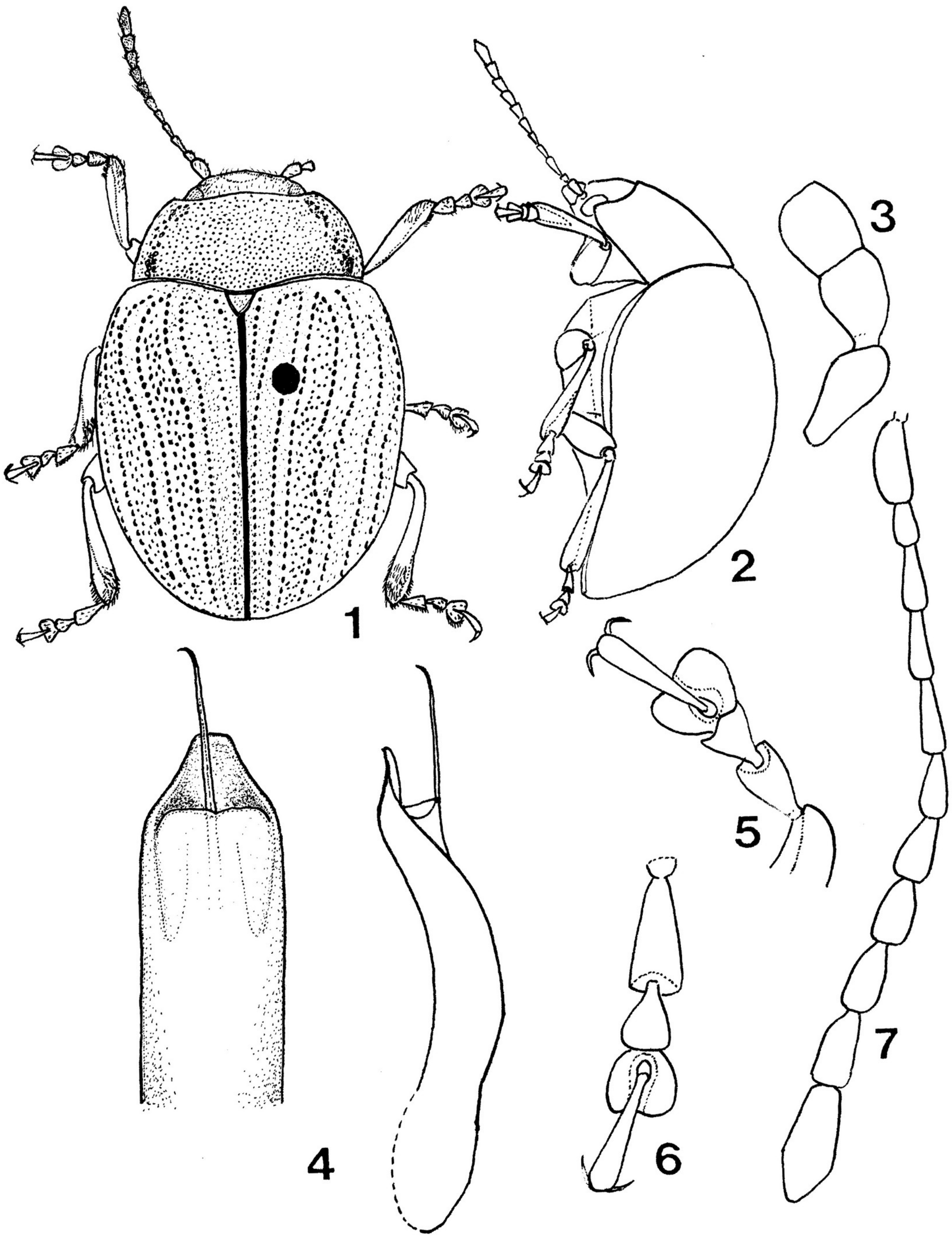
Ch. hudsonica Brown, 1937



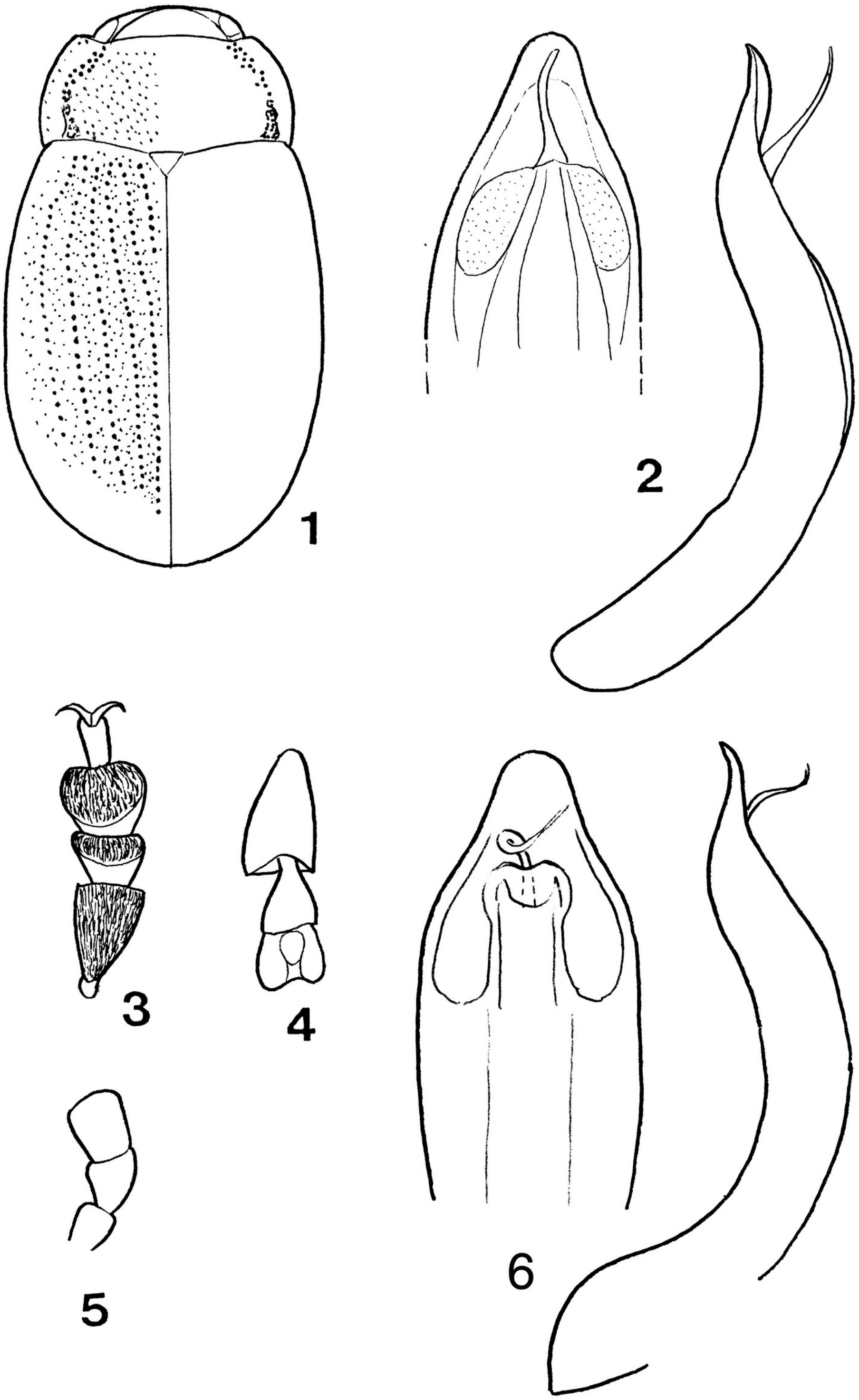
***Chalcoidea* figure 1:** 1–3 – *Chrysolina marginata bodemeyeri*, male (syntype, Iran): 1 – aedeagus, dorsal and lateral view, 2 – fore-tarsus, 3 – hind-tarsus; 4–7 – aedeagus, dorsal and lateral view: 4 – *Ch. marginata waldheimi* (Kyrgyzstan), 5 – *Ch. marginata marginata* (Armenia), 6–7 – *Ch. marginata finitima* (6 – Kola Penins., 7 – Bering Sea shore). (Orig.)



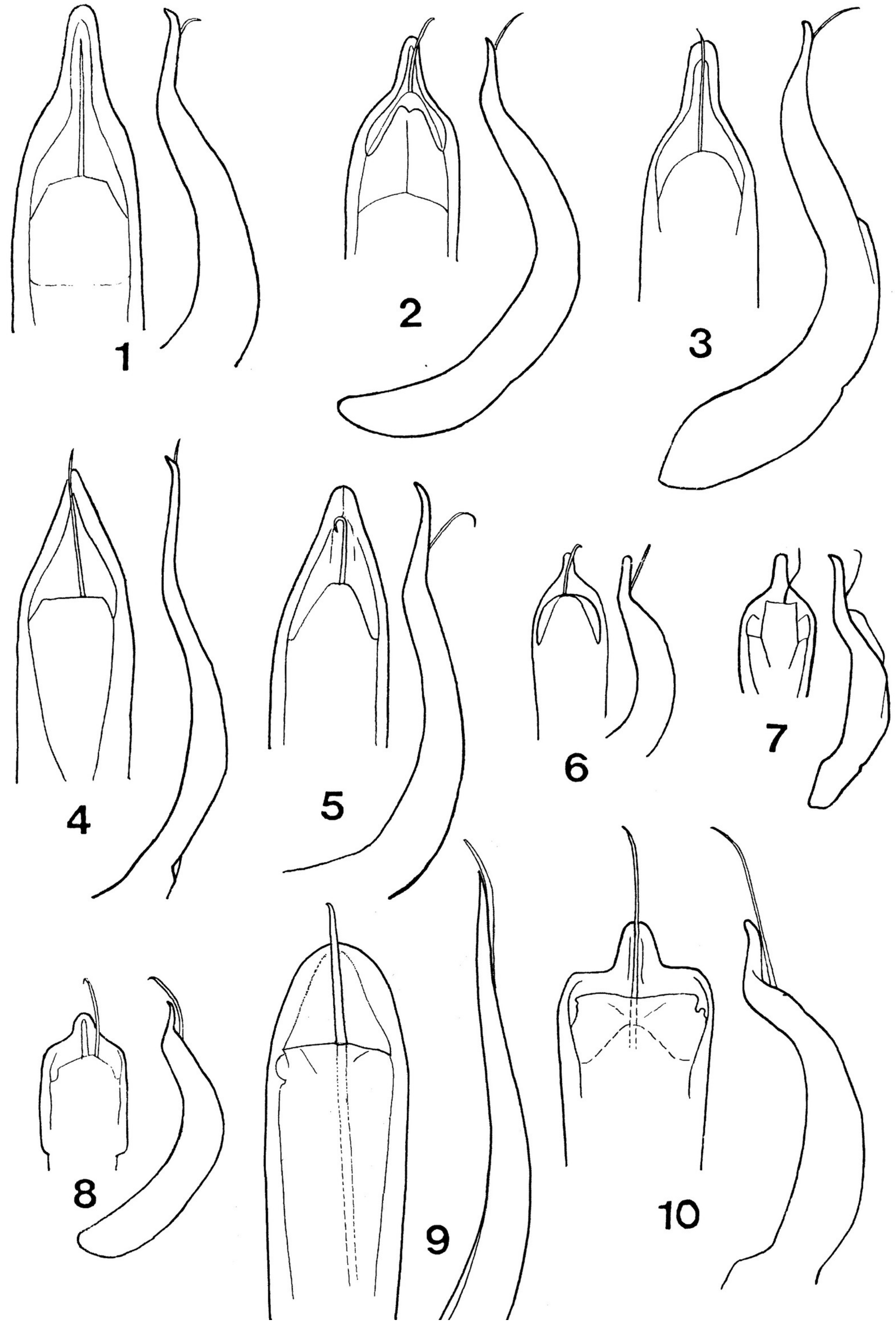
***Chalcoidea* figure 2:** 1–8 – aedeagus, dorsal view: 1 – *Chrysolina marginata marginata* (*Ch. marginata unificans*, syntype, Azerbaijan: Nakhichevan), 2 – *Ch. marginata dierythra* (Sicily), 3 – *Ch. marginata sanguineocincta* (Jordan), 4 – *Ch. marginata glacialis* (Switzerland), 5 – *Ch. marginata waldheimi* (Kazakhstan), 6 – *Ch. marginata marginata* (Pyrenees), 7 – *Ch. marginata* intermediate specimen between nominotypical subspecies and subspecies *waldheimi* (Russia: Kurgan reg.), 8 – *Ch. janbechynei* (syntype, Spain); 9–10 – *Ch. vagecincta sarroensis*: 9 – paratype (Morocco), aedeagus, dorsal view, 10 – dorsal general view. (After: Kocher, 1958: 10; others – orig.)



***Chalcoidea* figure 3:** *Chrysolina janbechynei*, male (*Chrysomela curvilinea*, lectotype, Spain: Aranjuez): 1 – dorsal view, 2 – lateral view, 3 – maxillary palpus, 4 – aedeagus, dorsal and lateral view, 5 – fore-tarsus, 6 – hind-tarsus, 7 – antenna. (Orig.)

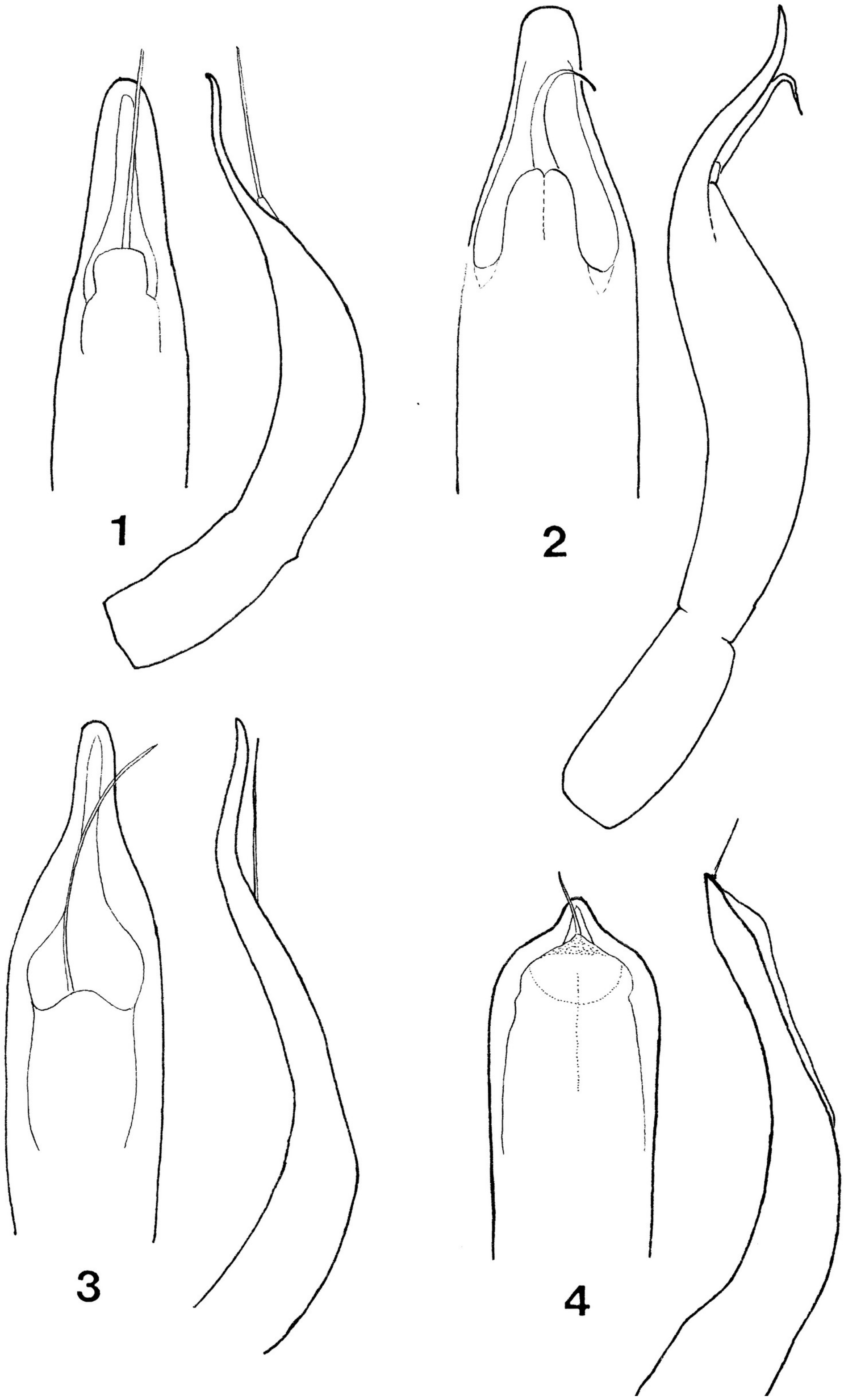


***Chalcoidea* figure 4:** *Chrysolina dieckmanni*: 1–5 – male (holotype, "Amur" – incorrect?): 1 – total dorsal view, 2 – aedeagus, dorsal and lateral view, 3 – sole of fore-tarsus, 4 – hind-tarsus, 5 – maxillary palpus; 6 – male (holotype *Ch. unicolor alaiensis*), aedeagus, dorsal and lateral view. (Orig.)

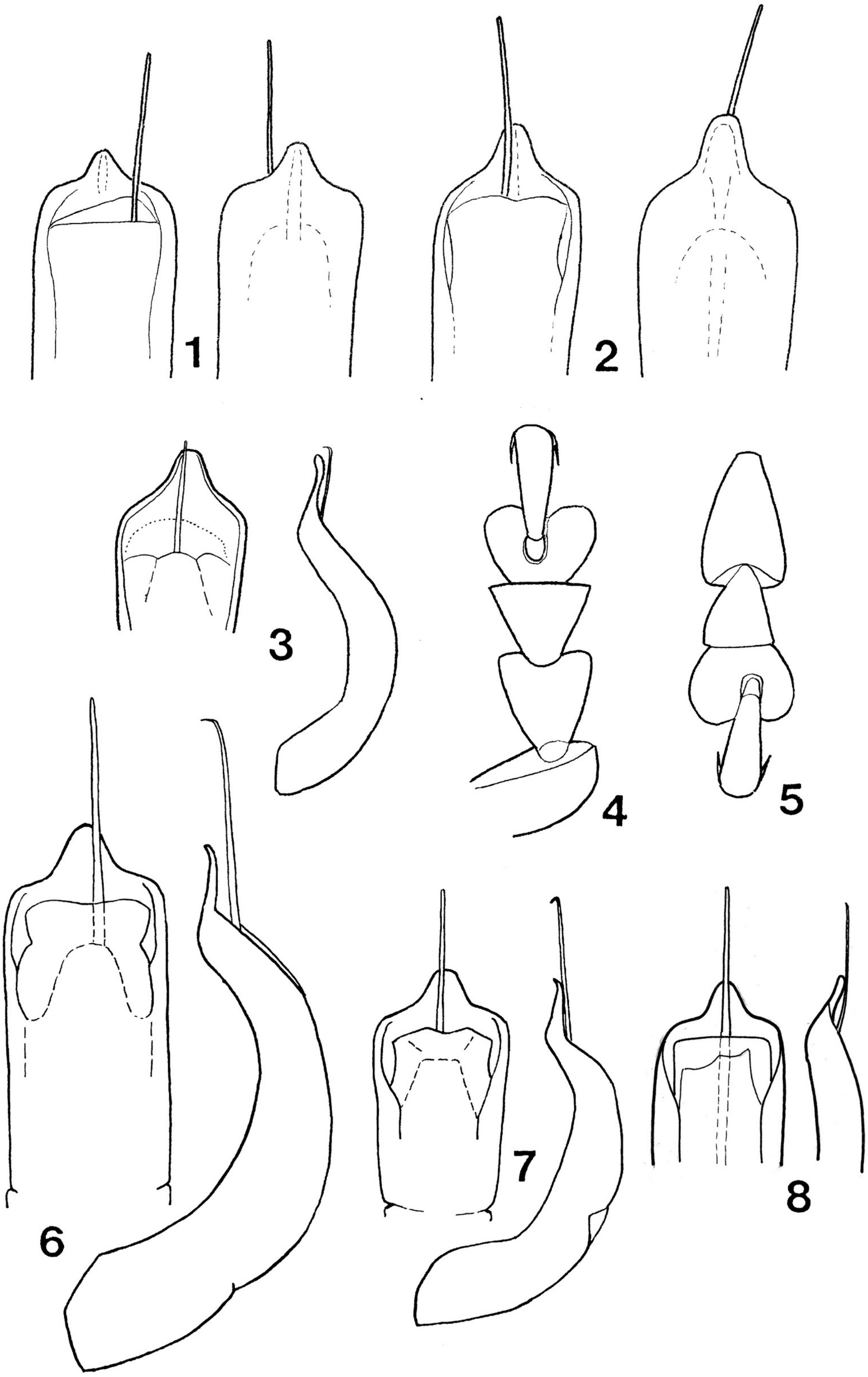


***Chalcoidea* figure 5:** Aedeagus, dorsal and lateral view: 1 – *Chrysolina carnifex carnifex* (Russia: Kursk reg.), 2 – *Ch. analis* (Austria), 3 – *Ch. zamotajlovi* (paratype, N-W Caucasus: Lagonaki Plateau), 4 – *Ch. songarica* (Azerbaijan: Nakhichevan), 5 – *Ch. besseri* (Kazakhstan), 6 – *Ch. lia*, 7 – *Ch. brahma*, 8 – *Ch. instabilis* (Yakutia), 9 – *Ch. levi* (holotype, Krasnodar Krai), 10

– *Ch. interstincta subseriata* (France). (After: Takizawa, 1980: 7; others – orig.)

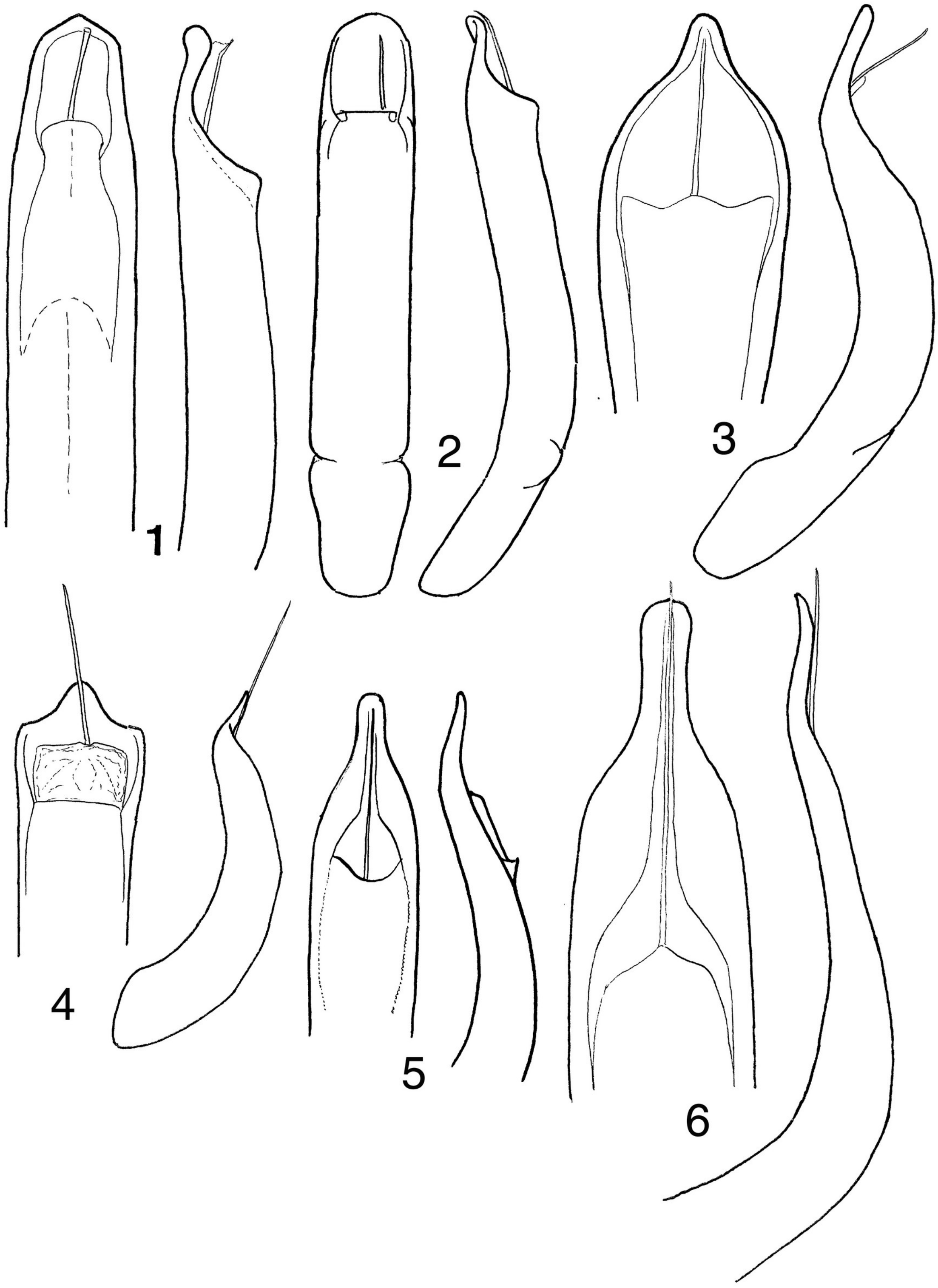


***Chalcoidea* figure 6.** Aedeagus, dorsal and lateral view: 1 – *Chrysolina superstes superstes* (Morocco: Atlas), 2 – *Ch. immarginata* (syntype, Issyk Kul lake), 3 – *Ch. carnifex carnifex* (*Ch. carnifex* var. *konowi*, syntype, Mecklenburg), 4 – *Ch. vagecincta vagecincta* (Tunisia). (Orig.)

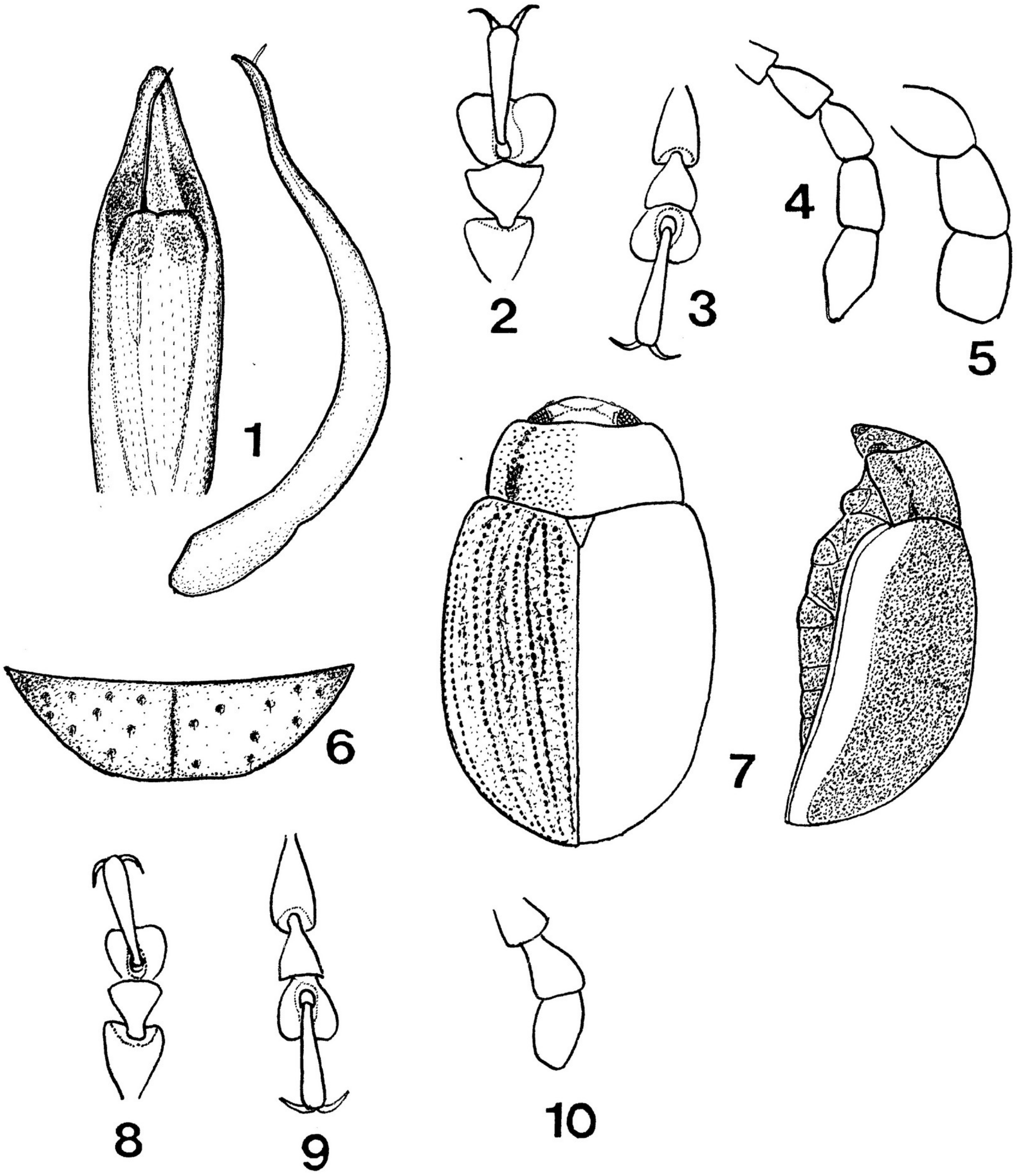


***Chalcoidea* figure 7:** 1–2 – *Chrysolina flavomarginata*, aedeagus, dorsal and ventral view (1 – Colorado, 2 – South Dakota); 3–5 – *Ch. hudsonica,* male (Hudson Bay): 3 – aedeagus, dorsal and lateral view, 4 – fore-tarsus, 5 – hind-tarsus; 6–8 – aedeagus, dorsal and lateral view: 6 – *Ch. tesari elbursica*

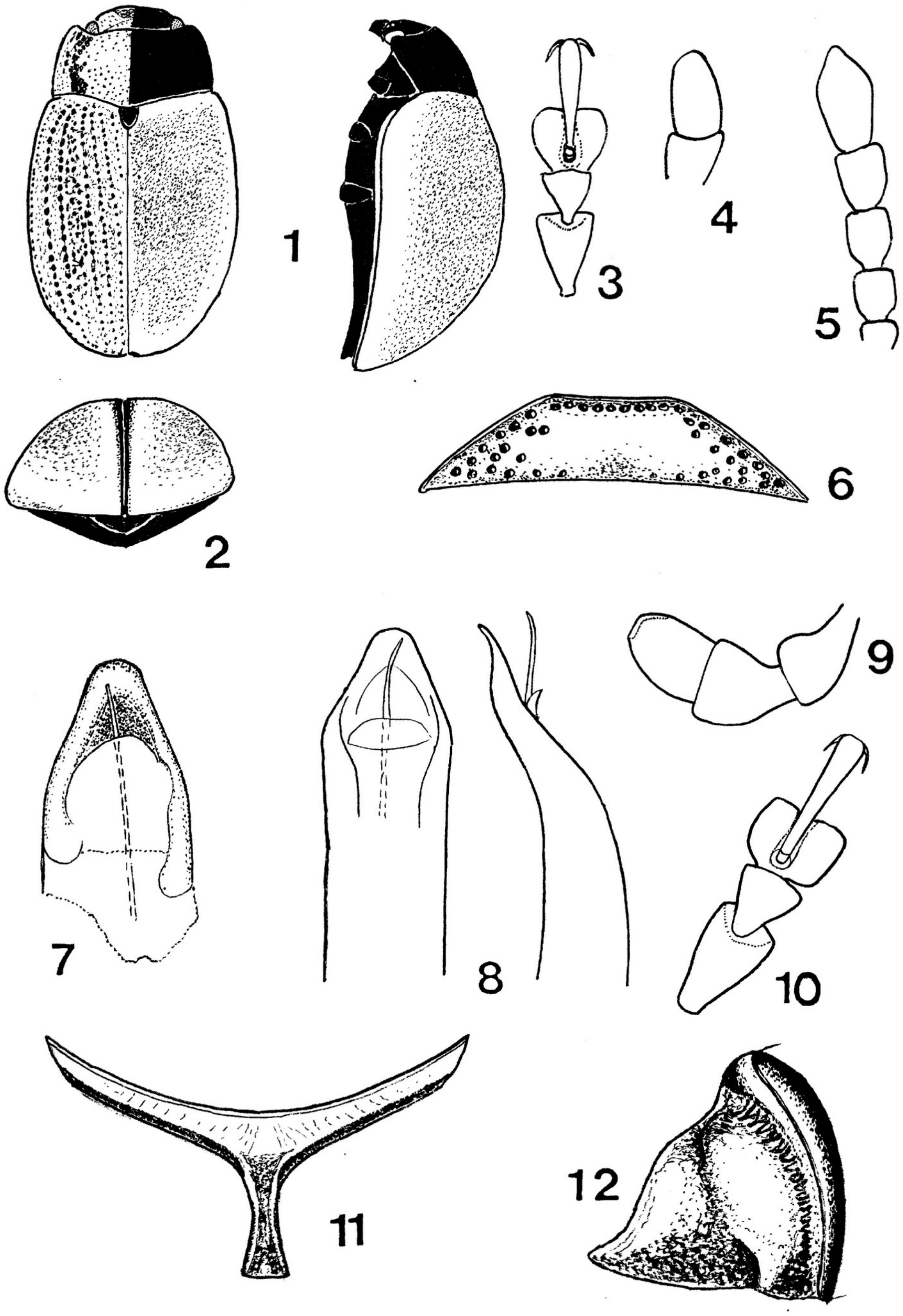
(Turkmenistan), 7 – *Ch. tesari tesari* (Azerbaijan), 8 – *Ch. extorris* (California). (Orig.)



***Chalcoidea* figure 8:** 1–6 – aedeagus, dorsal and lateral view: 1 – *Chrysolina lehri* (S-E Kazakhstan), 2 – *Ch. lehri* (holotype, Kazakhstan: Alma-Ata reg.), 3 – *Ch. lia* (*Ch. freyi*, paratype, W Pamir), 4 – *Ch. tesari tesari* (*Ch. kulzeri*, syntype, S Caucasus), 5 – *Ch. carnifex burdigalensis* (syntype, S-W France), 6 – *Ch. carnifex hollandei* (N Algeria). (Orig.)

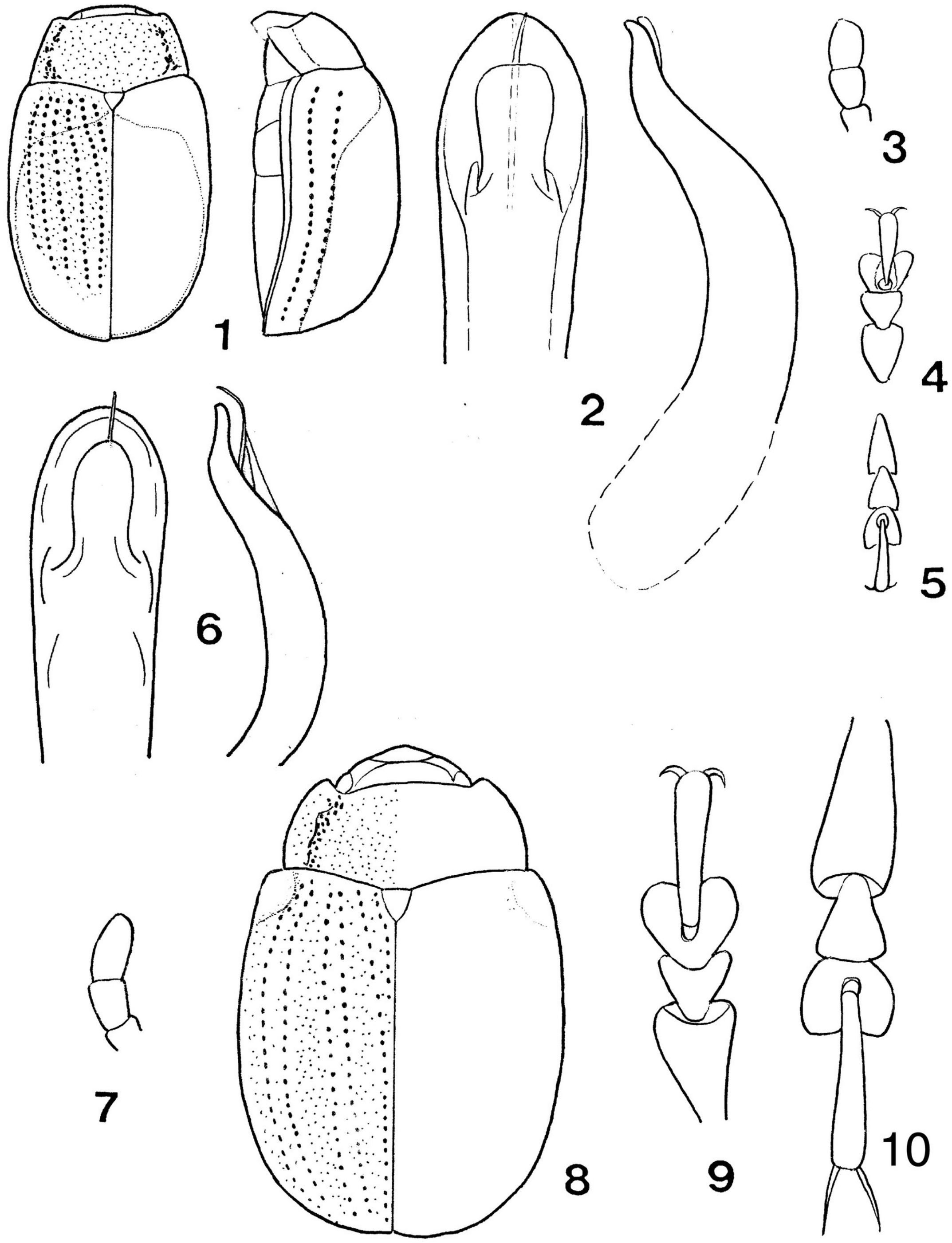


***Chalcoidea* figure 9:** *Chrysolina songarica* (*Chrysomela amasiensis*: 1–7 – male, lectotype (Turkey: Amasia), 8–10 – female, paralectotype (Turkey: Anatolian Plateau: Sultan Dagh)): 1 – aedeagus, dorsal and lateral view, 2 – fore-tarsus, 3 – hind-tarsus, 4 – 8th–11th antennomeres, 5 – maxillary palpus, 6 – last abdominal sternite, 7 – dorsal and lateral view, 8 – fore-tarsus, 9 – hind-tarsus, 10 – maxillary palpus. (Orig.)

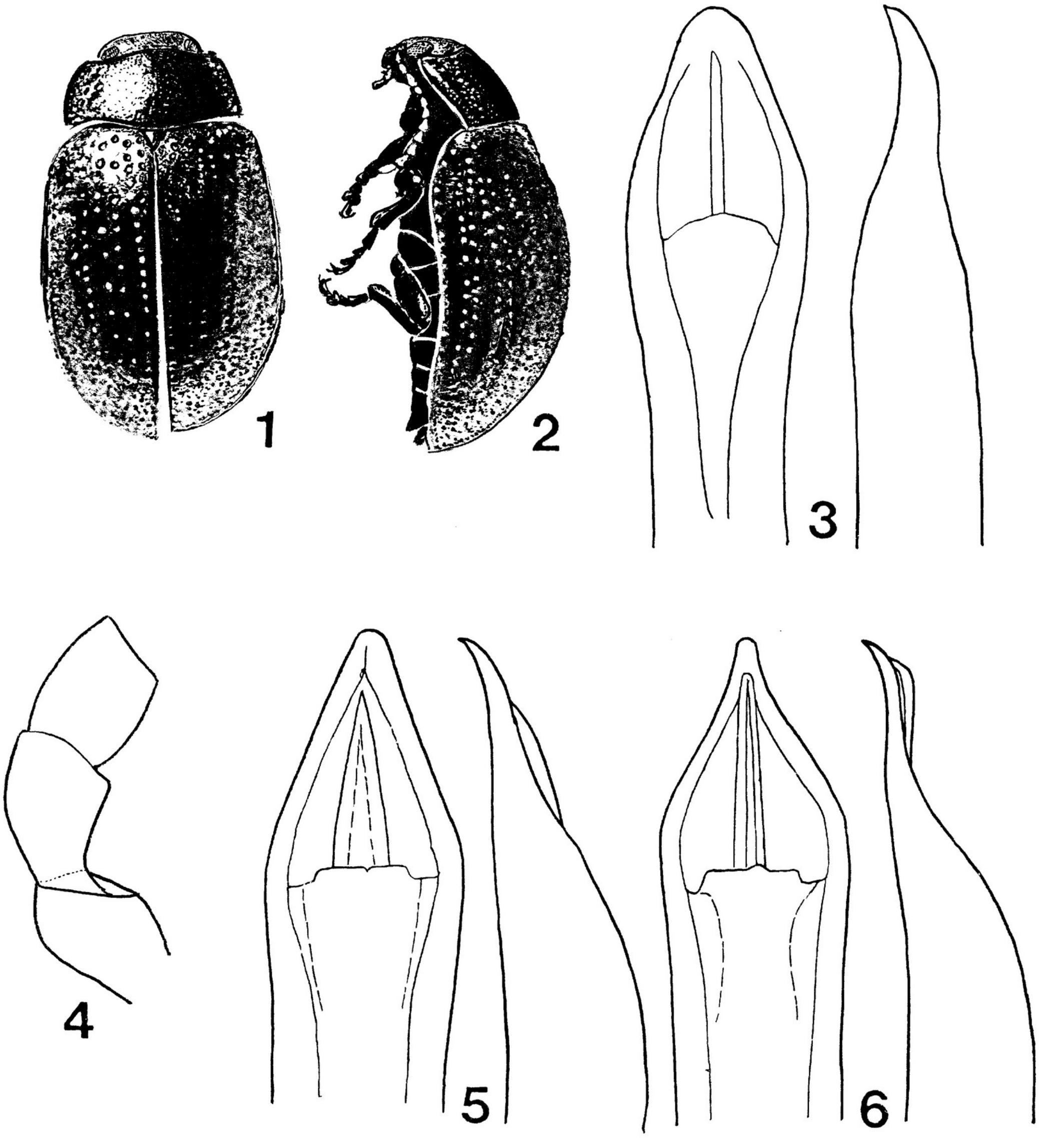


***Chalcoidea* figure 10:** *Chrysolina sellata*: 1–7 – male (lectotype, Turkey: Amasia): 1 – dorsal and lateral view, 2 – view from behind, 3 – mid-tarsus, 4 – maxillary palpus, 5 – 8–11th antennomeres, 6 – last abdominal sternite, 7 – aedeagus, dorsal view; 8–10 – male (*Chrysomela cilissa*, holotype, Turkey: Gülek Bodhaz): 8 – aedeagus, dorsal and lateral view, 9 – maxillary palpus, 10

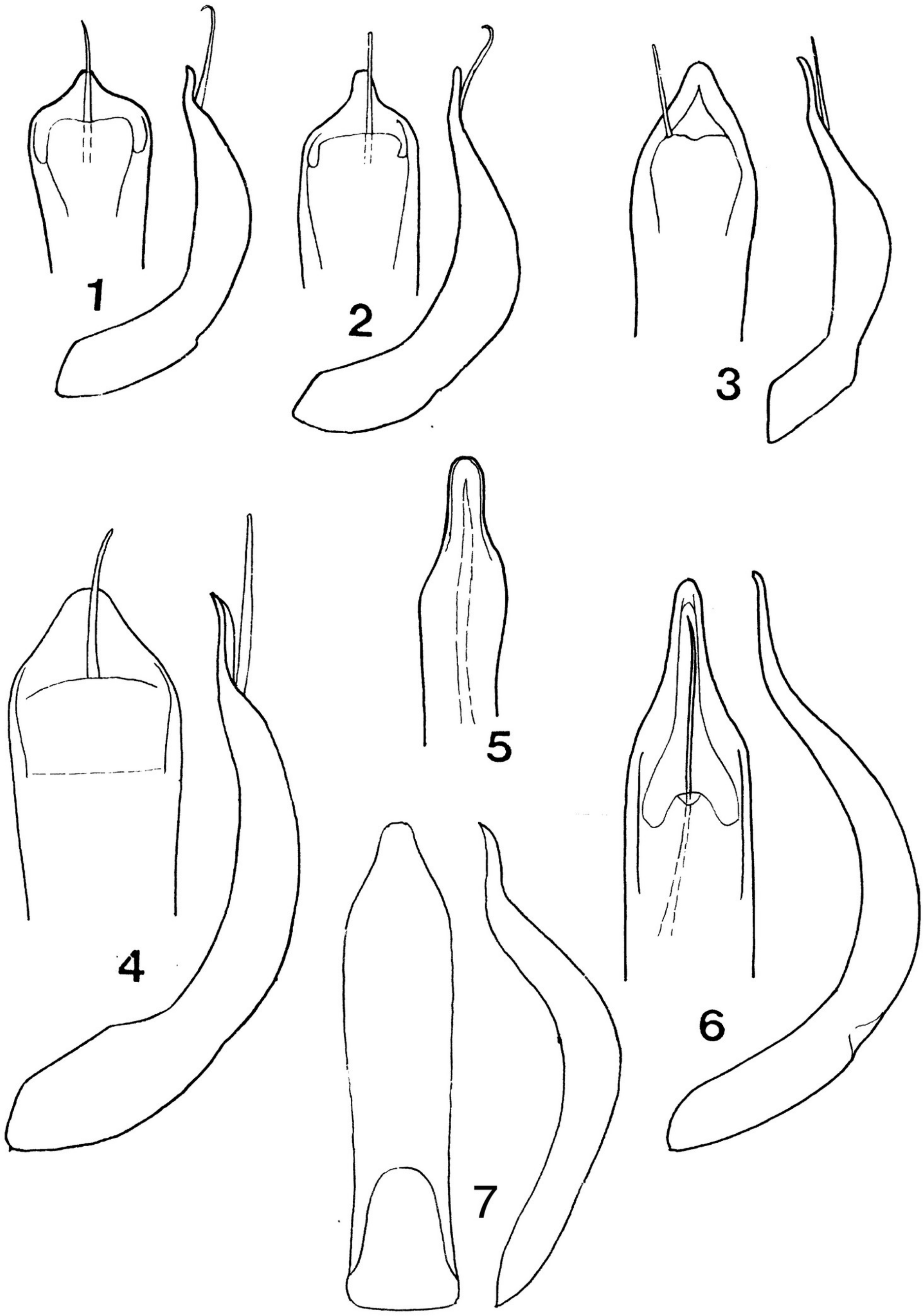
– fore-tarsus; 11–12 – female (*Chrysomela cilissa*, topotype): 11 – prosternum, 12 – prothoracic hypomeron. (Orig.)



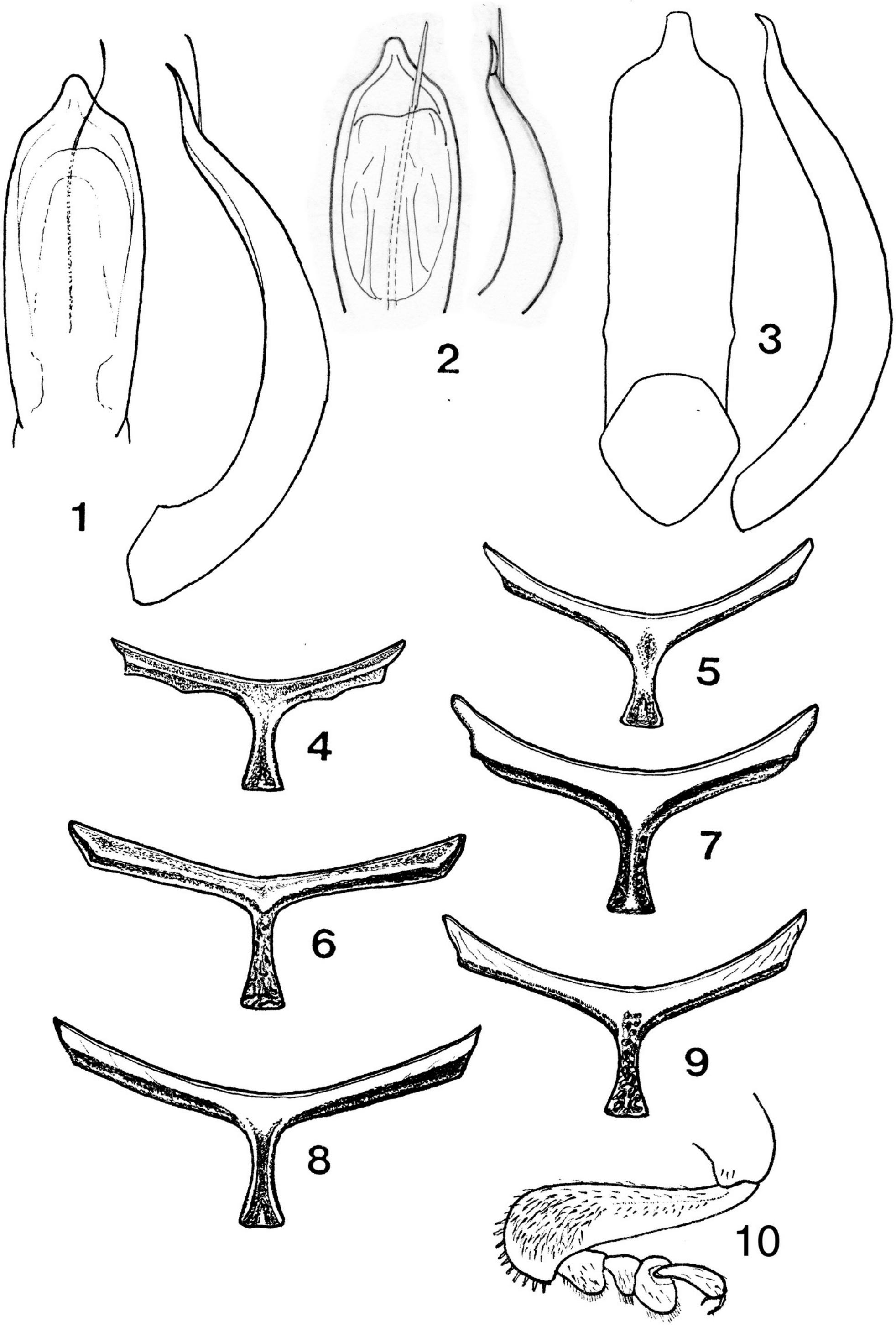
***Chalcoidea* figure 11:** 1–6 – *Chrysolina turgaica*: 1–5 – male (Kazakhstan: Turgaiskaya oblast): 1 – dorsal and lateral view, 2 – aedeagus, dorsal and lateral view, 3 – maxillary palpus, 4 – fore-tarsus, 5 – hind-tarsus, 6 – male (holotype, Kazakhstan: Turgaiskaya oblast), aedeagus, dorsal and lateral view; 7–10 – *Ch. superstes superstes*, female (Morocco): 7 – maxillary palpus, 8 – dorsal view, 9 – fore-tarsus, 10 – hind-tarsus. (Orig.)



***Chalcoidea* figure 12:** 1–4 – *Chrysolina manipurensis* (1, 2, 4 – female, India: Assam; 3 – male, holotype): 1 – dorsal view, 2 – lateral view, 3 – aedeagus, dorsal and lateral view, 4 – maxillary palpus; 5–6 – *Ch. vishnu,* aedeagus, dorsal and lateral view (5 – India: Kurseong, 6 – Nepal). (After: Daccordi, 1980a: 3; others – orig.)

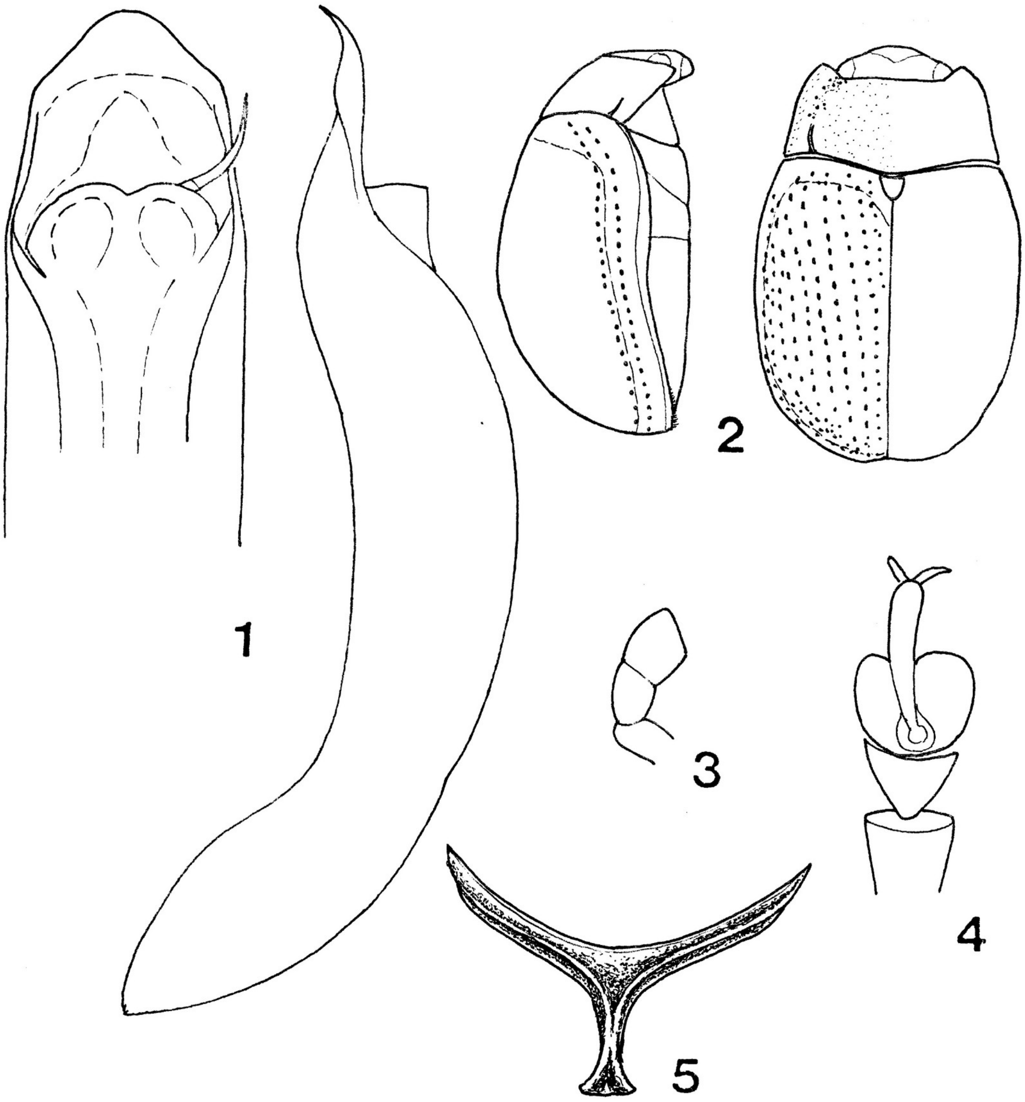


***Chalcoidea* figure 13:** 1–7 – aedeagus: 1 – *Chrysolina pusa* (Mongolia), dorsal and lateral view, 2 – *Ch. lopatini* (Irkutsk reg.), dorsal and lateral view, 3 – *Ch. brunnicornis bermani* (Chita reg.: Kodarskyi ridge), dorsal and lateral view, 4 – *Ch. rufilabris* (Transbaikalia), dorsal and lateral view, 5 – *Ch. carnifex melanaria*, neotype (S France), aedeagus immature and slightly folded longitudinally, ventral view, 6 – *Ch. carnifex coerulescens*, lectotype (Germany: Mainz), dorsal and lateral view, 7 – *Ch. brunnicornis brunnicornis*, syntype, ventral and lateral view. (After: N.V. Voronova orig. fig.: 7, others – figs. by the author)

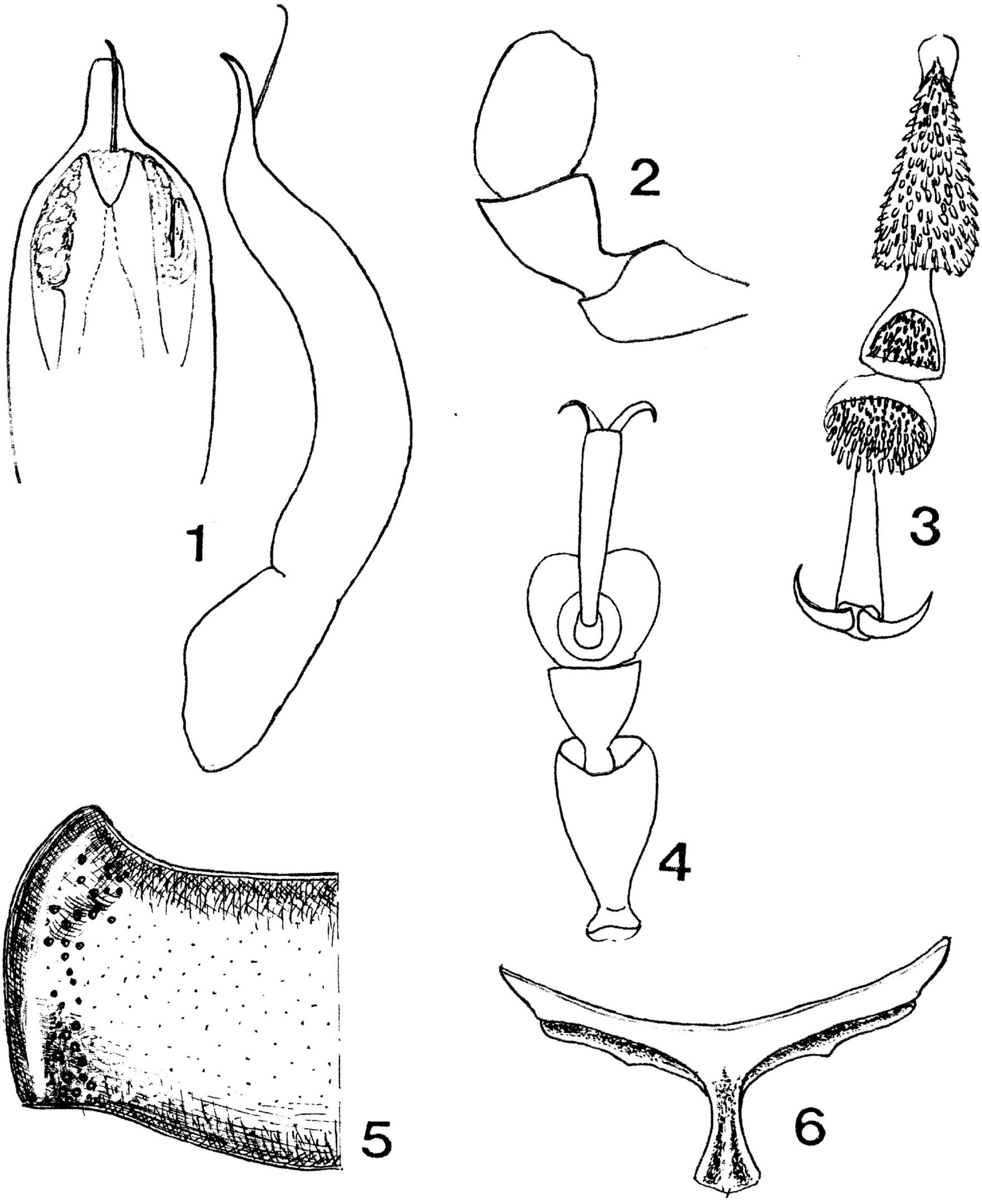


***Chalcoidea* figure 14:** 1–3 – aedeagus: 1–2 – *Chrysolina zangana*: 1 – male (Tibet), dorsal and lateral view, 2 – male, paratype (Xizang), dorsal and lateral view, 3 – *Ch. sajanica*, ventral and lateral view; 4–9 – prosternum: 4 – *Ch.*

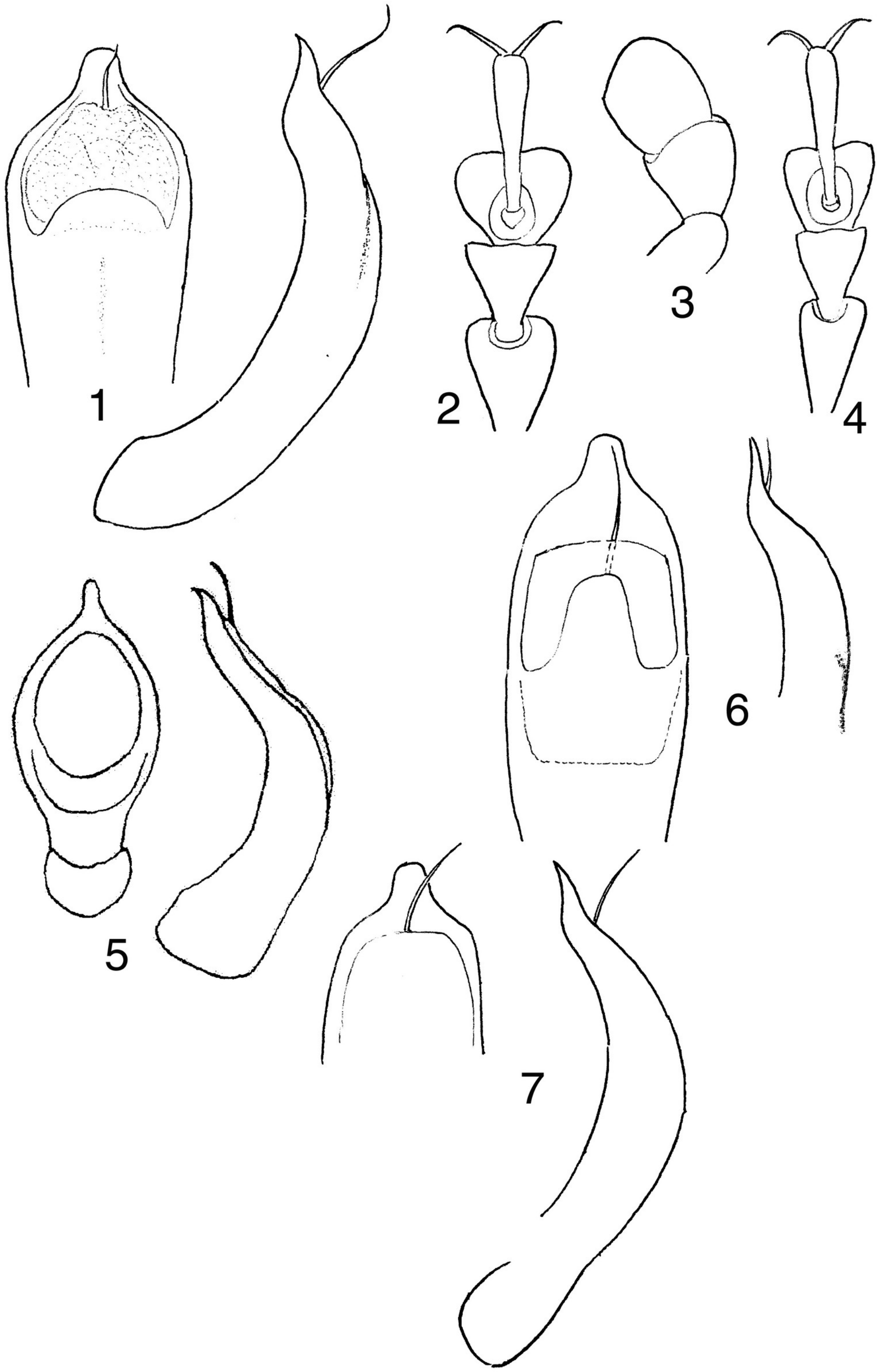
hudsonica, male, 5 – *Ch. carnifex carnifex*, female, 6 – *Ch. zamotajlovi*, paratype, male, 7 – *Ch. interstincta subseriata*, female, 8 – *Ch. superstes superstes*, male, 9 – *Ch. immarginata*, female; 10 – *Ch. rufilabris*, male, foretibia and tarsus (Transbaikalia). (Orig.)



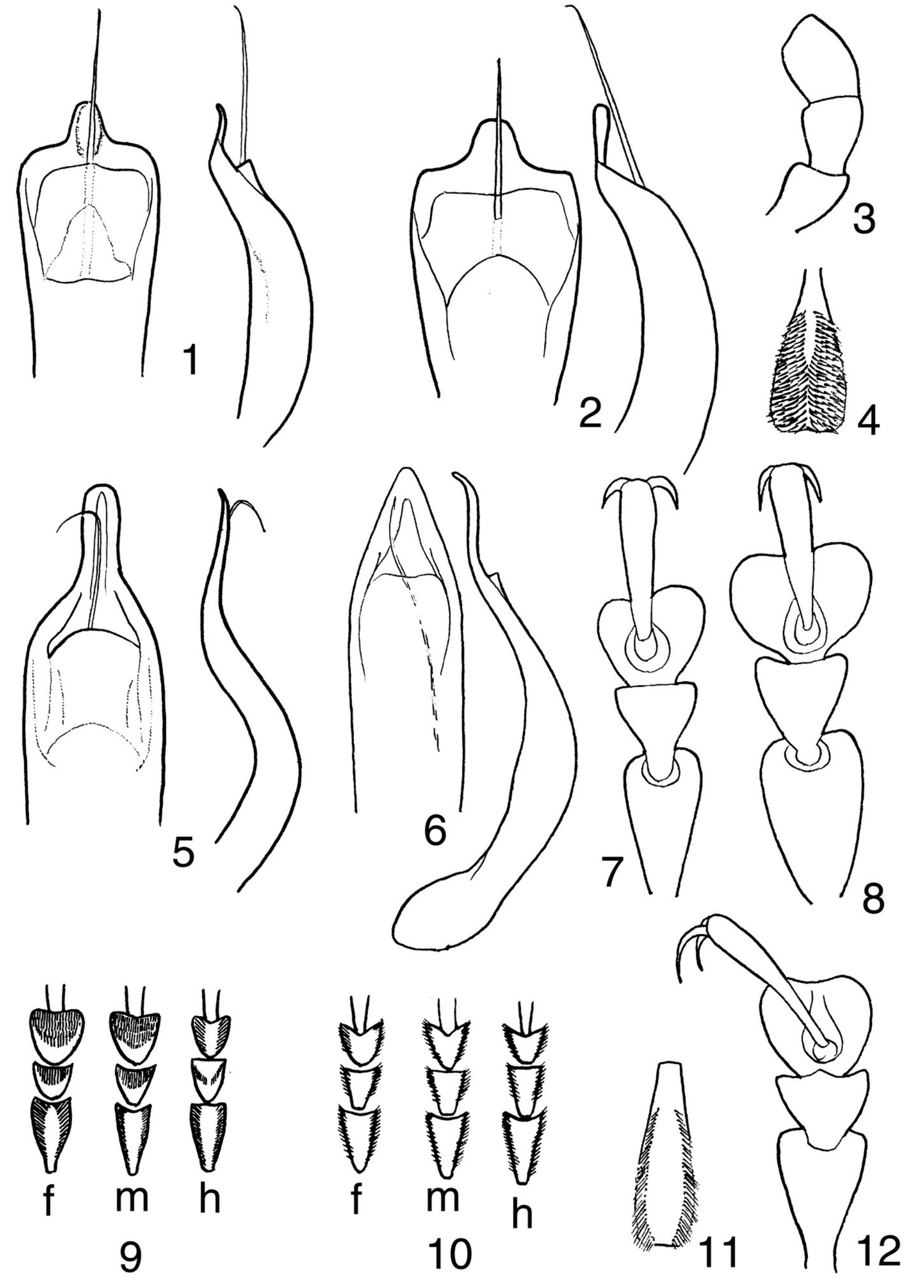
***Chalcoidea* figure 15:** *Chrysolina taygetana*, male (Greece: Taigeto Mts.): 1 – aedeagus, dorsal and lateral view, 2 – general view, dorsal and lateral, 3 – maxillary palpus, 4 – fore-tarsus, 5 – prosternum. (Orig.)



Chalcoidea **figure 16:** *Chrysolina brahma*, male, paratype (India: Chini, Bashahr State): 1 – aedeagus, dorsal and lateral view, 2 – maxillary palpus, 3 – hind-tarsus, ventral view, 4 – fore-tarsus, dorsal view, 5 – pronotum, 6 – prosternum. (Orig.)

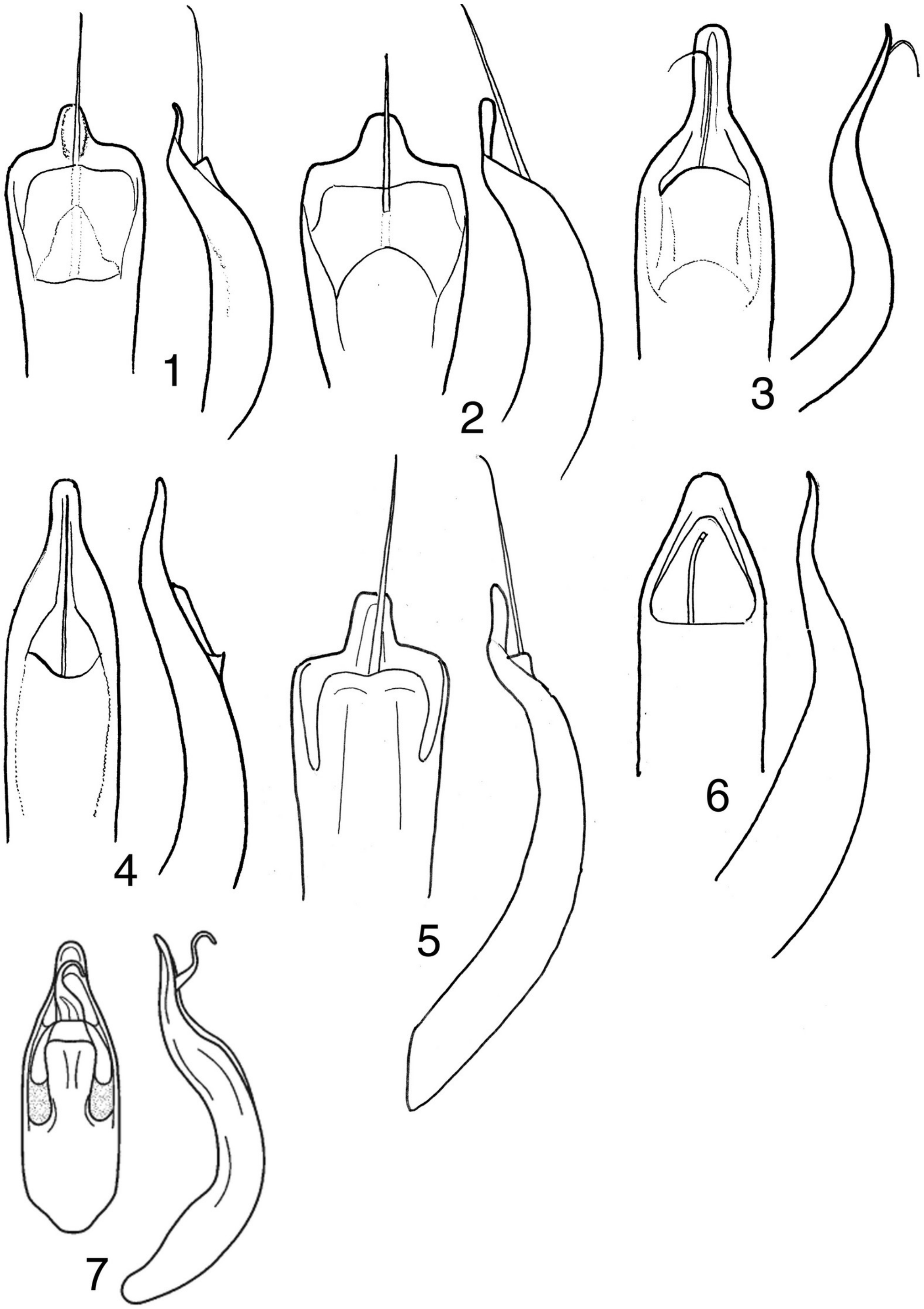


***Chalcoidea* figure 17:** *Chrysolina zangana*: 1–3 – male (China, Xinjiang): 1 – aedeagus, dorsal and lateral view, 2 – fore-tarsus, 3 – maxillary palpus; 4 – female (China, Xinjiang), fore-tarsus; 5 – male (holotype *Ch. luchti*, China, Xinjiang), aedeagus, dorsal and lateral view; 6 – male (paratype *Ch. nyalamana*, China, Xizang), aedeagus, dorsal and lateral view; 7 – male, paratype (China, Xizang), aedeagus, dorsal and lateral view. (After: Lopatin, 2000a: 5; others – orig.)



***Chalcoidea* figure 18.** 1 – *Chrysolina interstincta subseriata* (syntype *Ch. interstincta coiffaiti*), aedeagus, dorsal and lateral view; 2 – *Ch. interstincta graellsii*, aedeagus, dorsal and lateral view; 3 – *Ch. marginata marginata*, male (European Russia), maxillary palpus; 4 – *Ch. zamotajlovi*, paratype, female, (N-W Caucasus), 1st hind-tarsomere underside; 5 – *Ch. marginata marginata*, male (syntype *Ch. marginata rugosopunctata*), aedeagus, dorsal and lateral view; 6 – *Ch. songarica*, male (syntype *Ch. hyrcana* var. *cyanescens*), aedeagus, dorsal and lateral view; 7–8 – male, fore-tarsus: 7 – *Ch. instabilis* (Taimyr), 8 – *Ch. marginata finitima* (Taimyr); 9–10 – *Ch. lia*, tarsomeres 1–3 below, fore-, mid-, hind-ones, respectively: 9 – male, 10 –

female; 11 – *Ch. besseri*, female (Astrakhan reg.), 1st hind-tarsomere underside; 12 – *Ch. lopatini*, male (Irkutsk reg.), fore-tarsus. (Orig.)



***Chalcoidea* figure 19.** Aedeagus, dorsal and lateral view: 1 – *Chrysolina interstincta subseriata* (syntype *Ch. interstincta coiffaiti*, S-W France), 2 – *Ch. interstincta graellsii* (ab. *benjamini*, Spain), 3 – *Ch. marginata marginata* (syntype *Ch. marginata rugosopunctata*, N Caucasus), 4 – *Ch. carnifex burdigalensis* (syntype, S-W France), 5 – *Ch. interstincta interstincta* (S Italy), 6 – *Ch. sellata* (syntype *Ch. bruneli*, Turkey), 7 – *Ch. ivanovi* (holotype, E Kazakhstan). (After: Mikhailov, 2022: 7; others orig.)

Subgenus *Chersomela* Weise, 1914

My friend, Mauro Daccordi, presented me his unpublished manuscript, entitled "Results Mauro Daccordi’s studies in different years in different museums about the typi of the *Chrysolina* subgen. *Athecna* in Afrotropical region" (Mauro considers *Atechna* (*=Athecna)* and *Chersomela* (= *Polysticta*) to be the same subgenus). This extremely valuable source includes 53 typewritten pages with photos and hand drawn pictures representing the types and non-type specimens (total views, aedeagi, different structural details, and type labels) of 57 nominal taxa, together with taxonomical notes. Mauro Daccordi examined the material from the following museums: NRS (Stockholm), UUZM (Uppsala), DEI (Müncheberg), MNSB (Bruxelles), MNHUB (Berlin), MNHN (Paris), KUZM (Kopenhagen), and BMNH (London).

Mauro Daccordi wrote in the cover letter: "Of course, you’ll be able to use all my notes as you think necessary for your studies". The manuscript really helped me to establish a systematic position of many taxa. So I dedicate this chapter, a review of the subgenus *Chersomela*, to my friend Mauro Daccordi.

Diagnosis

Above mostly with contrasting coloration, consisting of yellow, rufous, red, or black (dark metallic) stripes, bands and spots on elytra; elytral pattern always symmetrical; rarely above entirely dark metallic.

Last maxillary palpomere oval or cylindrical, as wide as palpomere 3, or slightly narrower than latter, similar in both sexes.

Pronotum with weak to obsolete lateral calli at the entire length. Pronotal impressions absent. Anterior side marginated and ciliate. Anterior setiferous pore present.

Prothoracic hypomeron with rugose lateral impression: 1) limited by outer border in anterior ½, and with only rugosity without distinct impression in posterior ½, or 2) without any lateral impression along entire length (or along almost entire length except for short groove anteriorly), or 3) with narrow lateral groove along entire length, or 4) with narrow lateral groove in anterior ½ and with rugose impression limited by outer border in posterior ½. Basal fold distinct, weak or absent.

Metasternum entirely marginated anteriorly.

Elytra without humeral calli, with 11 equidistant rows of dense punctures and flat intervals. Puncture rows regular or partly irregular. Elytral epipleura horizontal, invisible in lateral view, ciliate mostly apically, rarely ciliate along entire length (in *Ch. duodecimguttata*).

Hind wings normally developed.

Tarsomeres 1–3 wholly pubescent beneath in both sexes. In male they broader than in female, or similar in both sexes. Claw tarsomere without denticles beneath.

Pygidium with longitudinal impression along entire length or in basal ½.

Last abdominal sternite mostly convex in both sexes, or medially depressed in male.

Aedeagus tube-shaped, large, 1.7–1.8 X shorter than elytral length, with apex rounded or bearing apical projection, or aedeagus small, 2.7–3.0 X shorter than elytral length, with narrowly drawn out or pointed apex; flagellum exposed, mostly simple, narrow or moderately wide, rarely complicated (in *Ch. tricolor*). *Ch. consimilis* is found to be ovoviviparous (embryos with developed mandibles, ocelli, legs, and body setation were observed within the female abdomen), and female has not spermatheca. Females of the other species, such as *Ch. pardalina* and *Ch. scotti*, have spermatheca.

Differential diagnosis

Characters	*Chersomela*	*Atechna*	*Camerounia*	*Polystictella*	*Pseudotimarchomima*	*Omolina*	*Liomela*
Large dense punctures on lateral ¼ of pronotum	present	present	absent	absent or present	present	present	present
Apical ½ of elytral epipleura in lateral view	invisible	visible	visible	invisible	visible	invisible	visible
Elytral epipleura ciliate...	apically (only in *Ch. duodecim-gutata* along entire length)	along entire length	along entire length	along entire length	apically	apically	apically
Elytral punctures	regular (sometimes partly confuse)	regular	irregular	regular or irregular	irregular	regular (partly confuse)	mostly confuse

Pronotal lateral sides	convex	convex	emarginated near base	convex	emarginated near base	convex	convex
2 denticles on claw tarsomere	absent	absent	absent	absent or present	present	absent	present
Hind wings	present	present	absent	present or absent	absent	absent	absent
Metaster-num anteriorly	marginated	marginated	immarginated	marginated	marginated	immarginated	marginated

Most species of the subgenus *Chersomela* inhabit S Africa. Only one species is known from Democratic Republic of Congo, one more species – from Angola, and finally another species from Namibia. *Chersomela* is characterized by the contrasting coloration, usually consisting of yellow, rufous, red, or black (dark metallic) stripes, bands and spots on the elytra. This kind of elytral pattern is always symmetrical. There are several *Chrysolina* subgenera, namely *Chersomela, Atechna, Polystictella, Pseudotimarchomima, Omolina*, and closely related genus *Camerounia* in the S and C Africa. These taxa can be separated with the following table.

Peculiar characters of the subgenus *Chersomela*

Band – transverse part of elytral pattern formed by fused color spots.
Intervals between elytral puncture rows are numbered from suture. The 1st interval is between suture and 1st entire puncture row (not counting the abbreviated scutellar row), therefore the last, 10th interval is between the 9th puncture row and elytral epipleura.
Stripe – longitudinal part of elytral pattern between adjacent puncture rows.

Notation of elytral color spots starts from the base toward the apex. E.g., the notation (3, 3, 2, 1) means that there are 3 spots in the first transverse row (along elytral base), 3 spots in the second row, 2 spots in the 3rd row, and 1 spot in the last 4th row.

Key to species

Some species have very variable coloration of body. The key includes only the most common of such color variations. Examination of male aedeagus is necessary for precise identification of the most species.

1(18) Prothoracic hypomeron with rugose lateral impression limited by outer border in anterior ½, and with only rugosity without distinct impression in posterior ½, or without any lateral impression along entire length, or without impression along almost entire length except for a short groove anteriorly.

2(7) Pronotum rufous or yellow, mostly with black or metallic pattern, but not bronze black with red lateral sides.

3(6) Elytron yellow (rufous), with 3–4 dark transverse bands, mostly separated in longitudinal quadrangular spots in intervals 2, 4, 6, and 8. Aedeagus bottle-shaped.

4(5) Elytral spots with distinct metallic blue luster. Apical projection of aedeagus longer than in the following species and not curved on the dorsal side. Head, pronotum, antennae (slightly darkened apically), and legs rufous, with black: vertex behind eyes (except middle), pronotal spots mostly forming letter "M"; elytra yellow with narrow sutural stripe and 4 interrupted bands black with blue luster; elytral epipleura yellow; underside black with rufous prothoracic hypomeron. Length 5.5–7.0 mm. S Africa.

Ch. sp. 57

5(4) Elytral spots purely black or with very weak metallic luster. Apical projection of aedeagus shorter than in the previous species and greatly curved on the dorsal side. Head black with rufous pattern, pronotum, antennae, scutellum, and legs rufous, with black pronotal spots mostly forming interrupted letter "M"; elytra yellowish rufous with suture and spots forming 3 interrupted bands and curved spot near apex black; epipleura yellow; underside black with rufous prothoracic hypomeron and last abdominal sternite or underside entirely rufous. Length 5.0–7.7 mm. Figs. 202–211. S Africa.

Ch. vigintiquatuorsignata (Thunberg, 1808)

6(3) Elytron yellow, with 3 dark metallic (bluish or greenish) serrate transverse bands, complete or separated in parts. Head black, pronotum yellow with black pattern, legs black, underside black with yellow prothoracic hypomeron. Aedeagus bottle-shaped with small, well separated apical protrusion. Length 6.2–8.2 mm. Figs. 78–85. S Africa.

Ch. oberprieleri Daccordi, 1986, in litt.

7(2) Pronotum unicolorous, black or dark metallic, or bronze black with red lateral sides.

8(17) Pronotum unicolorous.

9(10) Elytral puncture rows irregular in part. Aedeagus bottle-shaped with very long apical projection. Head, pronotum, underside, legs, and scutellum black with weak metallic reflection; elytra pale yellow with narrow sutural stripe and spots forming 3 interrupted transverse bands chestnut brown with distinct green reflection; epipleura pale yellow margined with brown. Length 6.4–8.3 mm. Figs. 22–28. S Africa.

Ch. eburnipennis (Clark, 1864)

10(9) Elytral puncture rows regular.

11(12) Head and pronotum metallic blue or green. Elytron yellow or rufous with metallic (blue or green) longitudinal stripes in intervals: sutural, 2, 4, 6, 8, complete or separated in parts. Underside and legs black with weak metallic luster. Aedeagus with trapezoidal apex and small apical protrusion. Length 6.4–7.1 mm. Figs. 125–128. S Africa.

Ch. picturata (Clark, 1864)

12(11) Head and pronotum black. Aedeagus bottle-shaped.

13(14) Elytron black with yellow pattern: lateral stripe connected with 4 spots and with 5 irregular discal spots: 1, 2, 1(1+1?), 1. Underside and legs pitchy brown. Aedeagus constricted at sides of apical orifice, with small apical protrusion. Length 7.4 mm (male). Female is unknown. Figs. 1–4. Democratic Republic of Congo.

Ch. burgeoni Bechyné, 1948a

14(13) Elytron yellow or orange with black or dark metallic pattern.

15(16) Elytron yellow with 3 dark metallic (bluish or greenish) serrate transverse bands, complete or separated in parts. (See also couplet 6). Figs. 78–85. S Africa.

Ch. oberprieleri Daccordi, 1986, in litt.

16(15) Elytron orange, with narrow longitudinal black lines on puncture rows, and with black spots mostly occupying intervals between rows 2 and 3, 4 and 5, 6 and 7 and forming three interrupted transverse bands. (ab. *lineolata* Clark) See also couplet 17. Figs. 63–65, 239. S Africa.

Ch. marshalli (Clark, 1864)

17(8) Pronotum bronze black with red lateral ¼. Elytron black with red lateral stripe, basal band and narrow irregular longitudinal stripes. Head blackish bronze with small rufous spot on vertex; elytral epipleura yellowish rufous; underside black with rufous lateral sides of prothoracic hypomeron and lateral sides of abdominal sternites 3–5; legs black with rufous bases of tibiae and apices of femora. Aedeagus with trapezoidal apex bearing small quadrangular apical protrusion. Length 5.2 mm (male). Figs. 63–65, 239. S Africa.

Ch. marshalli (Clark, 1864)

18(1) Prothoracic hypomeron with narrow lateral groove along entire length or with narrow groove in anterior ½ and with rugose impression limited by outer border in posterior ½.

19(26) Aedeagus large, 1.7–1.8 X shorter than elytral length, mostly broadly rounded apically (only in *Ch. multifida* with short apical projection). Fore-tarsomeres 1–3 distinctly broadened in male. Pygidium with distinct longitudinal medial impression along entire length.

20(25) Elytron black (or dark metallic) with yellow pattern, rarely yellow with dark sutural stripe.

21(24) Aedeagus broadly rounded at apex.

22(23) Aedeagus slightly extended at apex, hook-shaped at apex (viewed laterally), with flagellum large, complicated. Male last abdominal sternite medially impressed. Head and pronotum bronze black or rufous; elytron purely black or black with weak coppery luster, with narrow yellow lateral stripe and 9 rounded yellow spots (2, 1, 3, 2, 1), rarely elytron yellow with dark sutural stripe; underside and legs black with weak bronze luster. Length 6.2–7.8 mm. Figs. 179–181, 189–193. S Africa.

Ch. tricolor (Vogel, 1870)

23(22) Aedeagus roundly extended at apex, slightly turned down apically (viewed laterally), with flagellum simple, long, narrow. Male last abdominal sternite convex. Head and pronotum greenish bronze, or head rufous, pronotum rufous with black basal band; elytron purely black or black with weak bluish luster, rarely light brown, with yellow lateral stripe interrupted at mid-length, and with 9 rounded yellow spots (2, 1, 3, 2, 1), rarely elytron entirely dark blue (ab. *nigra*); underside and legs black with bluish luster. Length 6.7–7.7 mm. Figs. 11–15. S Africa.

Ch. consimilis (Clark, 1864)

24(21) Aedeagus with short drawn apical protrusion. Male last abdominal sternite with medial longitudinal furrow. Head and pronotum dark greenish bronze, elytra black with yellow 10th interval and discal pattern (2 spots in basal ½ and 2 irregular bands in apical ½); legs and underside black with metallic luster. Length: available specimens: 6.5 mm (male), 7.0–7.1 mm (females); 7.6–9.5 mm (according to Clark, 1864). Figs. 71–77. S Africa.

Ch. multifida (Clark, 1864)

25(20) Dorsum entirely dark metallic: head and pronotum bronze, elytra coppery. Male last abdominal sternite medially impressed. Figs. 182–188. S Africa.

Ch. tricolor ab. *africana* (Jacoby, 1898) (see also couplet 22)

26(19) Aedeagus small, 2.7–3.0 X shorter than elytral length, with narrowly drawn out or pointed apex. Fore-tarsomeres 1–3 narrow or slightly broadened in male. Pygidium with longitudinal medial impression developed mostly in basal ½, only in 3 species (*Ch. hottentotta, Ch. soluta*, and *Ch. vulpina*) – developed along entire length.

27(34) Elytron dark with yellow rounded spots; with 10th interval entirely dark, at least much darker than spots.

28(29) Ocular groove reaching clypeus. Elytral epipleura ciliate along entire length. Elytron dark metallic: purple, green or violet, with 6 (2, 2, 2) yellow spots. Head, pronotum, and underside rufous, brown, or black. Aedeagus with long drawn apex. Length 6.6–8.2 mm. Figs. 16–21. S Africa.

Ch. duodecimguttata (Thunberg, 1787)

29(28) Ocular groove developed along upper edge and partly along interior edge of eye and does not reaching clypeus. Elytral epipleura ciliate only apically. Elytron black, brown or rufous, with 7–10 yellow spots.

30(31) Elytron rufous with 9 (3, 3, 2, 1) oculate (yellow margined with dark brown) spots; medial spot in the 2nd band sometimes separated into 2 spots. Head and pronotum unicolorous, dark blue or dark greenish bronze. Underside and legs bluish black. Aedeagus with narrow, long apical protrusion broadened at the end. Length 6.6–7.5 mm. Figs. 129–134. S Africa.

Ch. polyops (Vogel, 1870)

31(30) Elytron with 10 (2, 1, 2, 2, 2, 1) or 7 (2, 2, 2, 1) non-oculate yellow spots.

32(33) Elytron background light brown with weak purple luster. Head and pronotum black (or dark blue) with red pattern. Underside and legs black with weak metallic luster. Aedeagus elongate triangular at apex, with small apical protrusion separated by constriction. Length 6.5–8.5 mm. Figs. 194–199. S Africa.

Ch. vigintimaculata (Clark, 1864)

33(32) Elytron background black. Head and pronotum entirely black; legs and underside black. Aedeagus similar to that in *Ch. vigintimaculata*. Length 6.1–8.4 mm. Figs. 200, 201. S Africa.

Ch. sp. 56 prope *vigintimaculata*

34(27) Elytron with 10th interval partly or entirely yellow.

35(68) Elytron dark with yellow discal pattern (stripes, bands, spots) or yellow with dark discal pattern.

36(43) Elytron dark with longitudinal yellow stripes.

37(38) Elytron with 3 yellow stripes; 1st and 2nd ones interrupted: 1st stripe begins on 2nd interval and ends on 3rd one, 2nd stripe begins on 6th interval and ends on 7th one, 3rd stripe occupies 10th interval. Elytral pattern varies: yellow stripes sometimes partly missing. Dorsal side, underside, and legs dark blue. Aedeagus elongate roundly triangular at apex, with well separated short apical protrusion. Length 5.0–6.5 mm. Figs. 167–175. S Africa.

Ch. soluta (Clark, 1864)

38(37) Elytron with uninterrupted yellow stripes.

39(42) Body less than 4.8 mm long.

40(41) Elytron dark blue with 3 yellow (rufous) stripes on intervals 2, 6, 10. Head and pronotum dark blue; underside black with metallic luster; legs pitchy brown. Aedeagus with short apical projection. Length 4.0–4.8 mm. Figs. 162, 163. S Africa.

Ch. sexlineata (Thunberg, 1821)

41(40) Elytron brown with 5 yellow stripes on intervals 2, 4, 6, 8, 10, sometimes alternating with spots on intervals 3, 5, 7, 9. Pronotum rufous, sometimes with obsolete brown pattern. Head, legs, and prothoracic hypomeron rufous, underside brown. Aedeagus elongate triangular at apex with well separated semicircular apical protrusion. Length 3.9–4.5 mm. Figs. 57–62. S Africa.

Ch. lineoligera (Vogel, 1870)

42(39) Body more than 6.5 mm long. Elytron black with 5 yellow stripes on intervals 2, 4, 6, 8, 10. Pronotum rufous. Head black; underside black with rufous prothoracic hypomeron and lateral sides of abdominal sternites 2– 4; legs black. Length 6.5–6.7 mm (females). Male is unknown. Figs. 176–178. S Africa.

Ch. taeniolata (Vogel, 1870)

43(36) Elytron with yellow or dark pattern consisting of separate or partially fused spots.

44(45) Elytron black with 10 large rounded yellow spots (2, 2, 3, 2, 1). Four spots occupying 10th interval are separate or partly fused to each other, other spots mostly separate. Pronotum yellow or red with black pattern, or entirely black. Coloration of legs and underside variable. Aedeagus elongate triangular at apex with small apical protrusion. Length 6.5–8.2 mm. Figs. 86–124. S Africa.

Ch. pardalina (Fabricius, 1781)

45(44) Elytron with complicated pattern consisting of partially fused and separate irregular spots.

46(49) Elytral basal ½ (inside of humeral tubercle) covered with one band consisting of two yellow (rufous) spots: large spot near scutellum and small outside one, these spots sometimes fused.

47(48) Elytral lateral yellow stripe with a step near mid-length. Pronotum bronze green, with red pattern or without it. Aedeagus elongate triangular at apex, with small rectangular apical protrusion. Head, underside, and legs black with weak metallic luster. Elytral yellow (rufous) pattern usually includes lateral stripe, one double spot in basal ½, one double band (or 2 separate spots) at mid-length, and 2 apical spots. Length 5.7–7.6 mm. Figs. 5–10. S Africa.

Ch. clathrata (Clark, 1864)

48(47) Elytral lateral yellow stripe even, without a step. Pronotum unicolorous, bronze green or bluish green. Aedeagus with rounded apical protrusion separated by constriction. Head, underside, and legs black with weak greenish luster. Elytral yellow pattern usually includes lateral stripe, one or two spots in basal ½, zigzag band not connected to lateral stripe at mid-length, and large apical spot including small black spot. Length 5.7–7.6 mm. Figs. 36–43. S Africa.

Ch. haemograpta Bechyné, 1948a

49(46) Elytral basal ½ (inside of humeral tubercle) covered with two bands consisting of three or four yellow (rufous) spots (1, 2 or 2, 2), spots in the 2nd band are sometimes fused to each other; or elytron yellow with dark pattern at greater part of the surface.

50(57) Tarsal claw with distinct angularly projection on the inner side near base.

51(52) Elytral puncture rows partly undulate or irregular. Pronotum and elytral background metallic green or blue. Head, legs, and underside black with weak metallic luster. Elytral pattern varies and usually includes lateral stripe and 8 spots (1, 2, 3, 2), partly fused to each other or with lateral stripe. Aedeagus elongate trapezoidal apically, with small apical protrusion. Length 5.3–7.5 mm. Figs. 143–149, 164–166. S Africa.

Ch. repanda (Wiedemann, 1821)

52(51) Elytral puncture rows regular.

53(54) Elytron yellow with dark metallic violet pattern which includes narrow sutural stripe and 10 spots (3, 3, 3, 1) usually partly fused to each other.

Head, pronotum, underside, and legs black. Aedeagus similar to that in *Ch. repanda*, however apical part (at level of apical orifice) thinner in lateral view. Length 5.3– 7.0 mm. Figs. 150–152. S Africa.

Ch. sp. 55 prope *repanda*

54(53) Elytron black or dark metallic with yellow pattern.

55(56) Elytral background black. Aedeagus parallel-sided up to the apex or with lateral sides slightly convergent, with small apical protrusion. Elytral yellow pattern includes lateral stripe and 8 (1, 2, 3, 2) spots, partly fused to each other and to lateral stripe. Head, pronotum, underside, and legs entirely black, or with rufous pronotal anterior and lateral sides and tibiae. Length 5.1–5.9 mm in available specimens, 7.0 mm after Clark (1864). Figs. 66–70. S Africa.

Ch. modesta (Clark, 1864)

56(55) Elytral background blue or violet. Aedeagus elongate trapezoidal at apex, with small, well separated apical protrusion. Yellow elytral pattern includes 3–4 lateral spots fused to each other by narrow bridges along epipleura border, and 3–5 discal spots (1, 2, 0–2). Pronotum entirely black, or rufous with double basal black spot. Head, underside, and femora black, tibiae, tarsi, and lateral sides of abdominal sternites yellow. Length 5.1–5.7 mm. Figs. 47–56. S-W Africa.

Ch. hottentotta (Weise, 1914)

57(50) Tarsal claw without distinct angularly projection on the inner side near base.

58(61) Elytral yellow pattern, when most developed, includes zigzag discal band, which always fused (!) with lateral stripe.

59(60) Aedeagus with shorter apical protrusion. Elytral background black, without metallic luster. Yellow pattern, when most developed, includes 4 spots in basal ½ of elytron, lateral stripe, zigzag band behind mid-length, and reticulated pattern at apical slope. Head, pronotum, legs, and underside black. Length 4.5–5.2 mm. Figs. 224–238. S Africa.

Ch. vulpina (Fabricius, 1781)

60(59) Aedeagus with longer apical protrusion. Elytral background black with blue or violet metallic luster. Yellow pattern, when most developed, includes 3 spots in basal ½ of elytron, lateral stripe, zigzag band behind mid-length, and 2 spots at apical slope. Head, pronotum, legs, and underside (except prothoracic hypomeron) black, prothoracic hypomeron rufous; or with pronotum rufous with black pattern, tarsi sometimes rufous. Length 4.6–6.3 mm. Figs. 29–35. S Africa.

Ch. figurata (Clark, 1864)

61(58) Elytral yellow pattern not including zigzag discal band, fused with lateral stripe.

62(63) Yellow pattern includes one large rounded spot occupying at least, basal ⅓ of elytral surface inside of humeral tubercle. Besides that, there are lateral stripe and 4 spots (2, 2) in apical ½; spots of the 1st pair fused to each other, and spots of the 2nd pair fused with lateral stripe, yellow pattern may increase. Head, pronotum, underside, and legs bluish black, or with pronotum rufous with black pattern and prothoracic hypomeron rufous. Aedeagus elongate triangular at apex with small apical protrusion. Length 5.5–6.7 mm. Figs. 135–142. S Africa.

Ch. pulchella (Clark, 1864)

63(62) Yellow pattern of elytron without large rounded spot in basal ⅓.

64(65) Pronotum yellow with black pattern. Elytron yellow at greater part of surface, with black pattern nearly cruciate. Legs and ventral side black with lateral part of prothoracic hypomeron yellow. S Africa.

Ch. pardalina ab. *subcruciata* (Clark, 1864) (see couplet 44)

65(64) Pronotum dark metallic.

66(67) Pronotum bronze, with about 50 large punctures at each lateral side. Yellow elytral pattern reticulate, dark elytral areas bluish black. Head, underside, and legs bronze. Aedeagus elongate roundly triangular at apex, with well-delimited large apical protrusion. Length 5.7–6.5 mm. Figs. 44–46. Angola.

Ch. hebe (Clark, 1864)

67(66) Pronotum dark blue or green, with 15–20 large punctures at each lateral side. Yellow elytral pattern consists of lateral stripe and 6 (2, 2, 2) more or less rounded spots, which sometimes partly missing. Elytral background, legs and underside bluish black. Aedeagus elongate triangular at apex, with well-delimited rounded apical protrusion. Length 4.9–5.1 mm. Figs. 218–223. S Africa.

Ch. vulpecula (Vogel, 1870)

68(35) Elytron dark with only yellow (rufous) lateral stripe.

69(72) Elytral lateral stripe uneven.

70(71) Body larger, usually more than 7 mm long. Elytral lateral stripe usually broadened apically and covering most part of apical slope. S Africa.

Ch. pardalina ab. *revestita* (Vogel, 1870) (see couplet 44)

71(70) Body smaller, less than 6.7 mm long. Elytral lateral stripe not covering apical slope. S Africa.

Ch. clathrata (Clark, 1864) (see couplet 47)

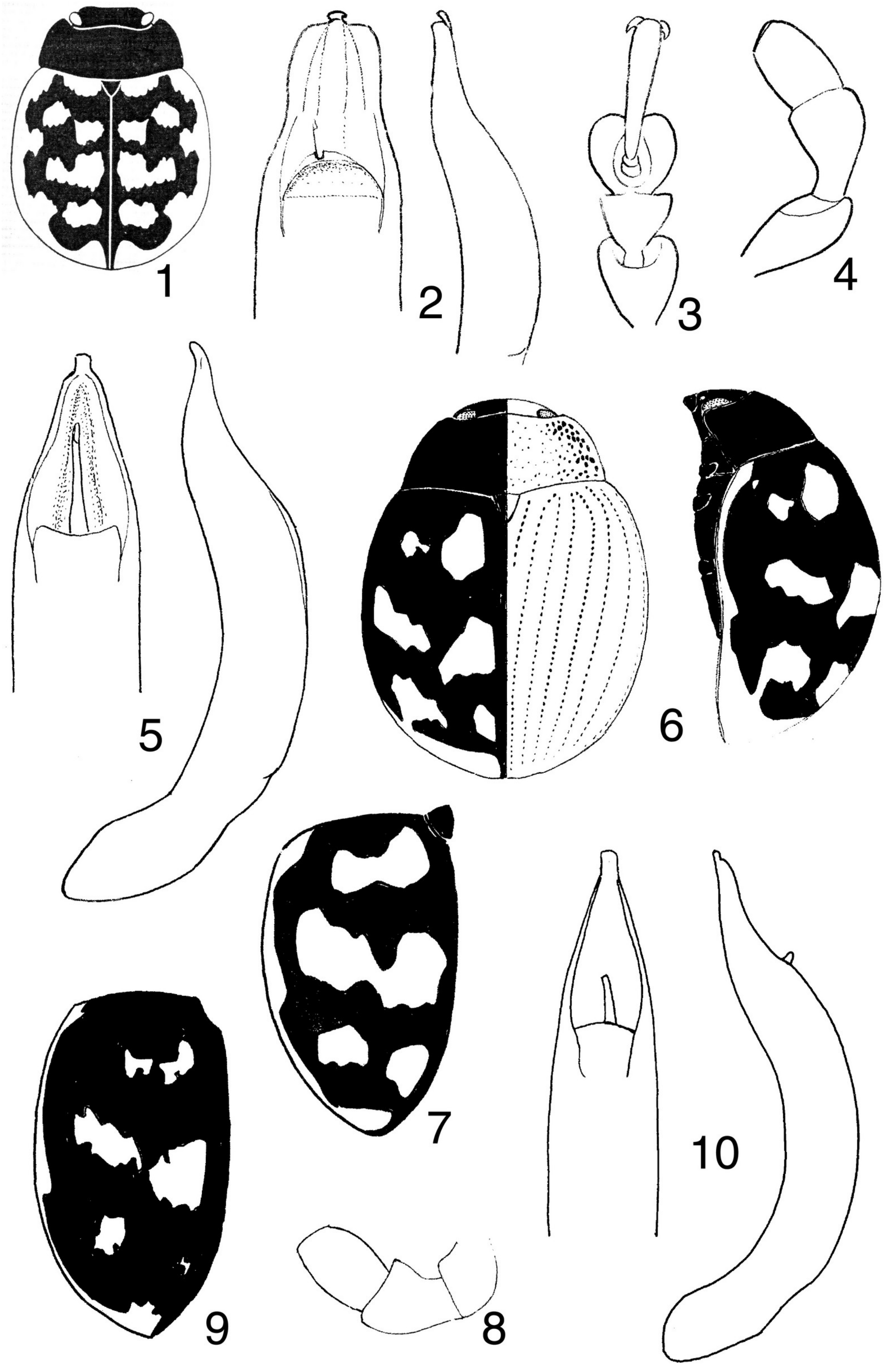
72(69) Elytral lateral stripe even, occupying only 10th interval.

73(74) Body smaller, less than 6.3 mm long. Antennomeres 6–10 broadened, each as long as wide. S Africa.

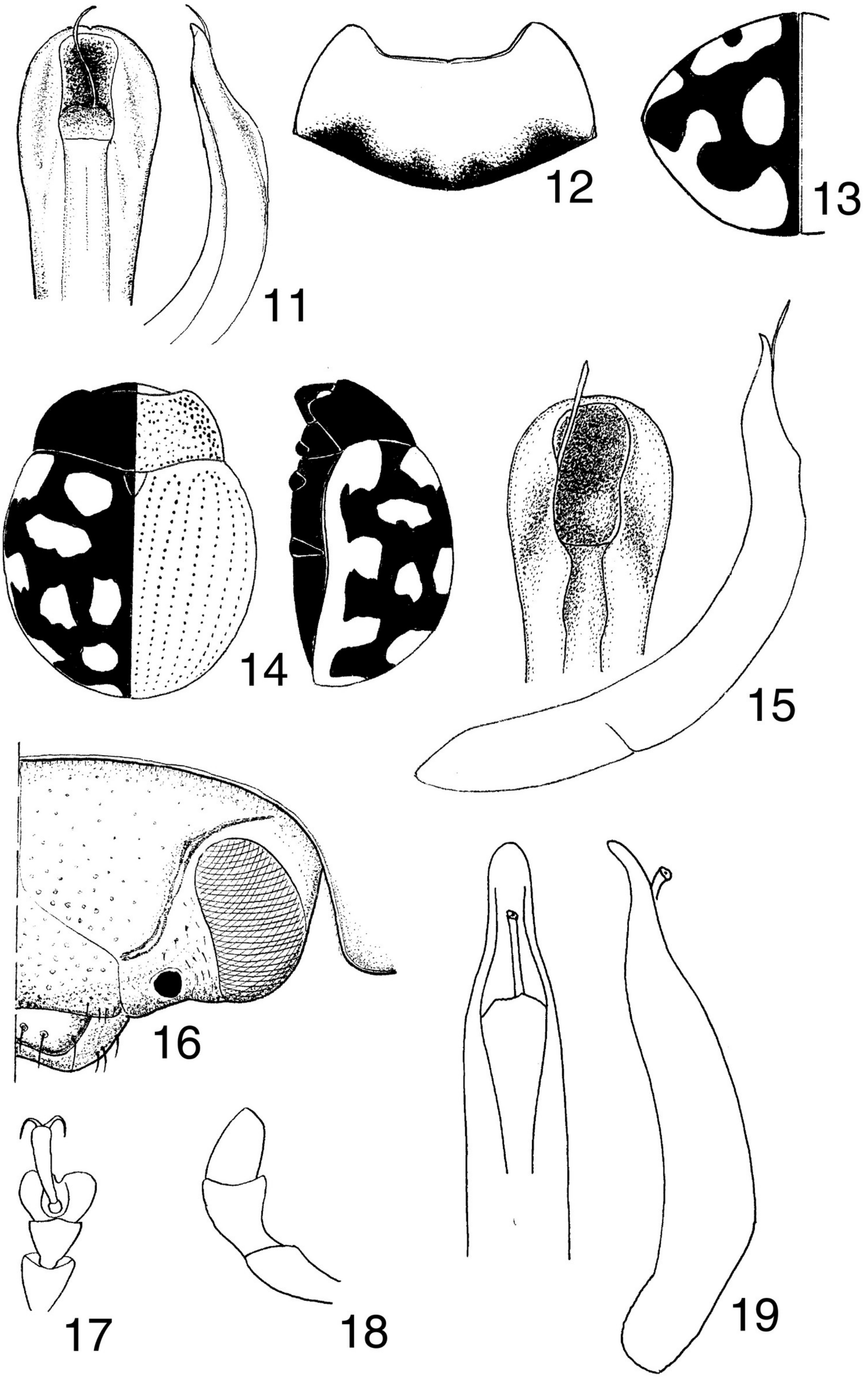
Ch. vulpina (Fabricius, 1781) + *Ch. figurata* (Clark, 1864) (see couplets 59, 60)

74(73) Body larger, more than 6.8 mm long. Antennomeres 6–10 narrow, elongate. Body black with light yellow elytral lateral stripe, occupying 10th interval. Aedeagus bottle-shaped with very long, narrow drawn apex. Length 6.8–9.5 mm. Figs. 153–161. S Africa.

Ch. scotti Daccordi, 2001

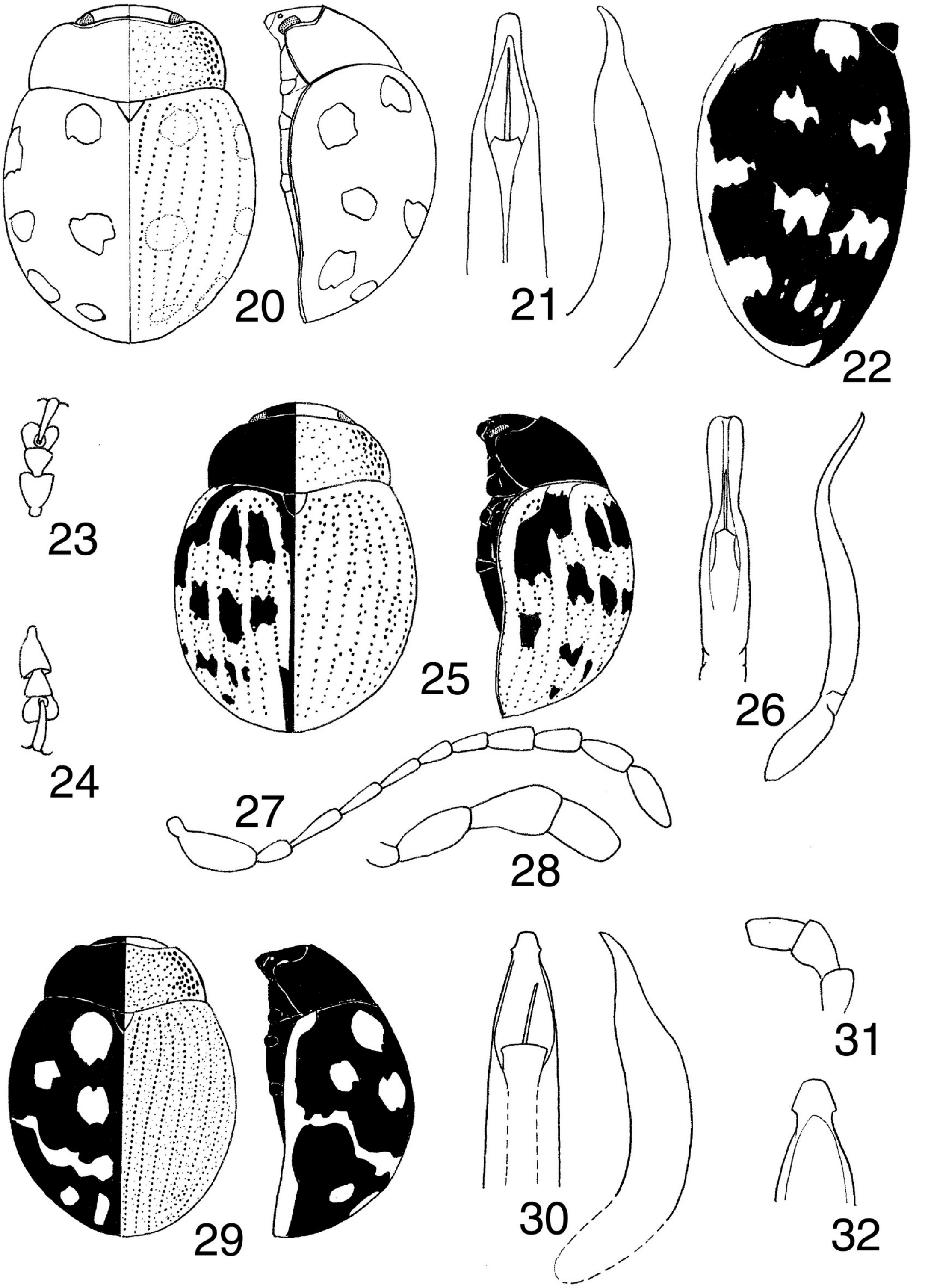


***Chersomela* figures 1–10**: 1–4 – *Chrysolina burgeoni*, male, holotype (Democratic Republic of Congo): 1 – dorsal view, 2 – aedeagus, 3 – foretarsus, 4 – maxillary palpus; 5–10 – *Ch. clathrata* (S Africa): 5 – aedeagus, 6 – female, dorsal and lateral view, 7 – male, left elytron, 8 – female, maxillary palpus, 9–10 – male, syntype: 9 – left elytron, 10 – aedeagus. (After: Bechyné, 1948a: 1; M. Daccordi, original figures: 9, 10; others – figs. by the author)



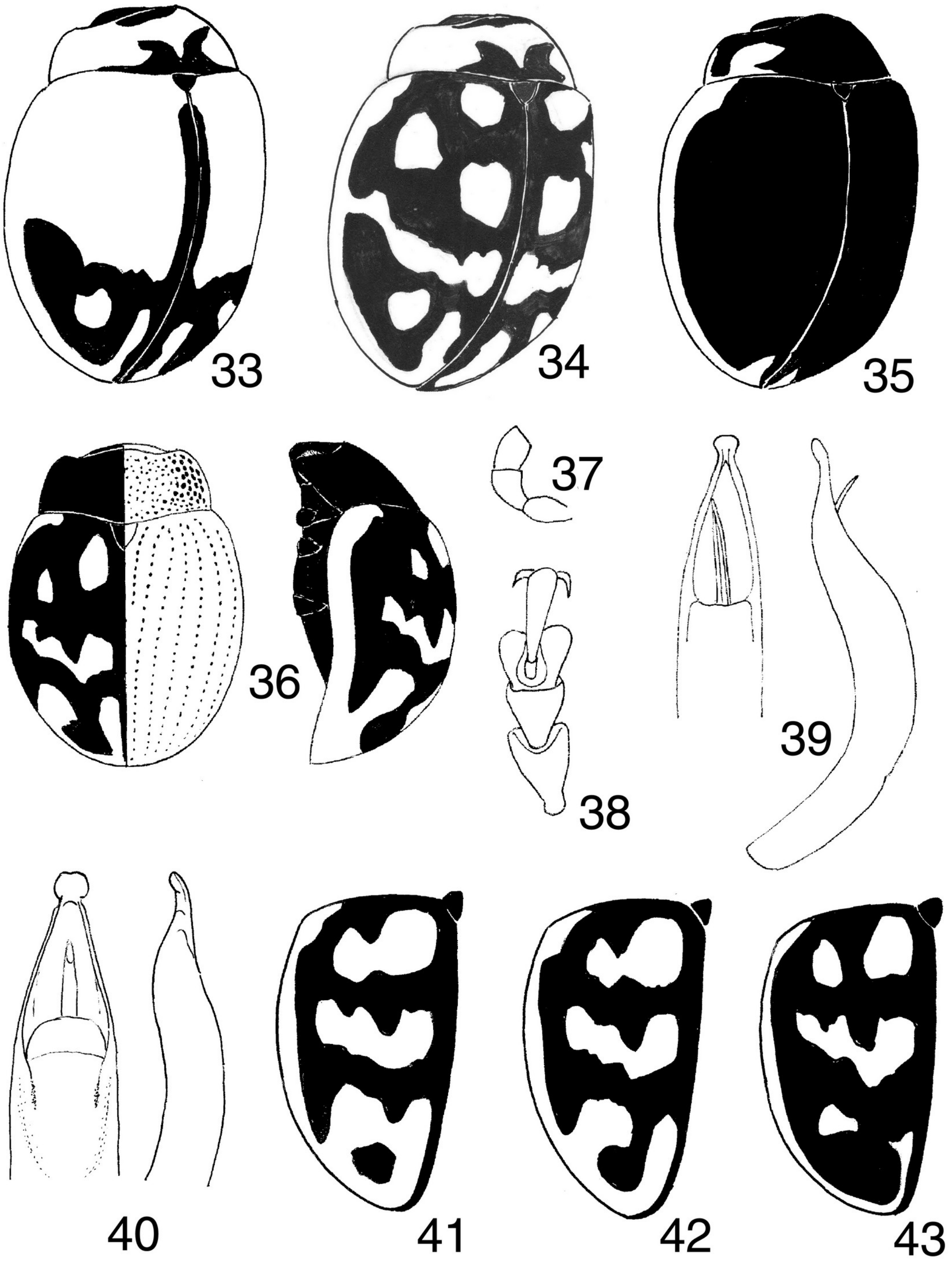
***Chersomela* figures 11–19** (S Africa): 11–15 – *Chrysolina consimilis*: 11–13 – male, holotype: 11 – aedeagus, 12 – pronotum, 13 – left elytron viewed from behind; 14–15 – male: 14 – dorsal and lateral view, 15 – aedeagus; 16–19 – *Ch.*

duodecimguttata: 16 – head, 17–18 – male, syntype: 17 – fore-tarsus, 18 – maxillary palpus, 19 – male (*Chrysomela quatuordecimguttata*, syntype), aedeagus. (Original figure by M. Daccordi: 19; others – figs. by the author)

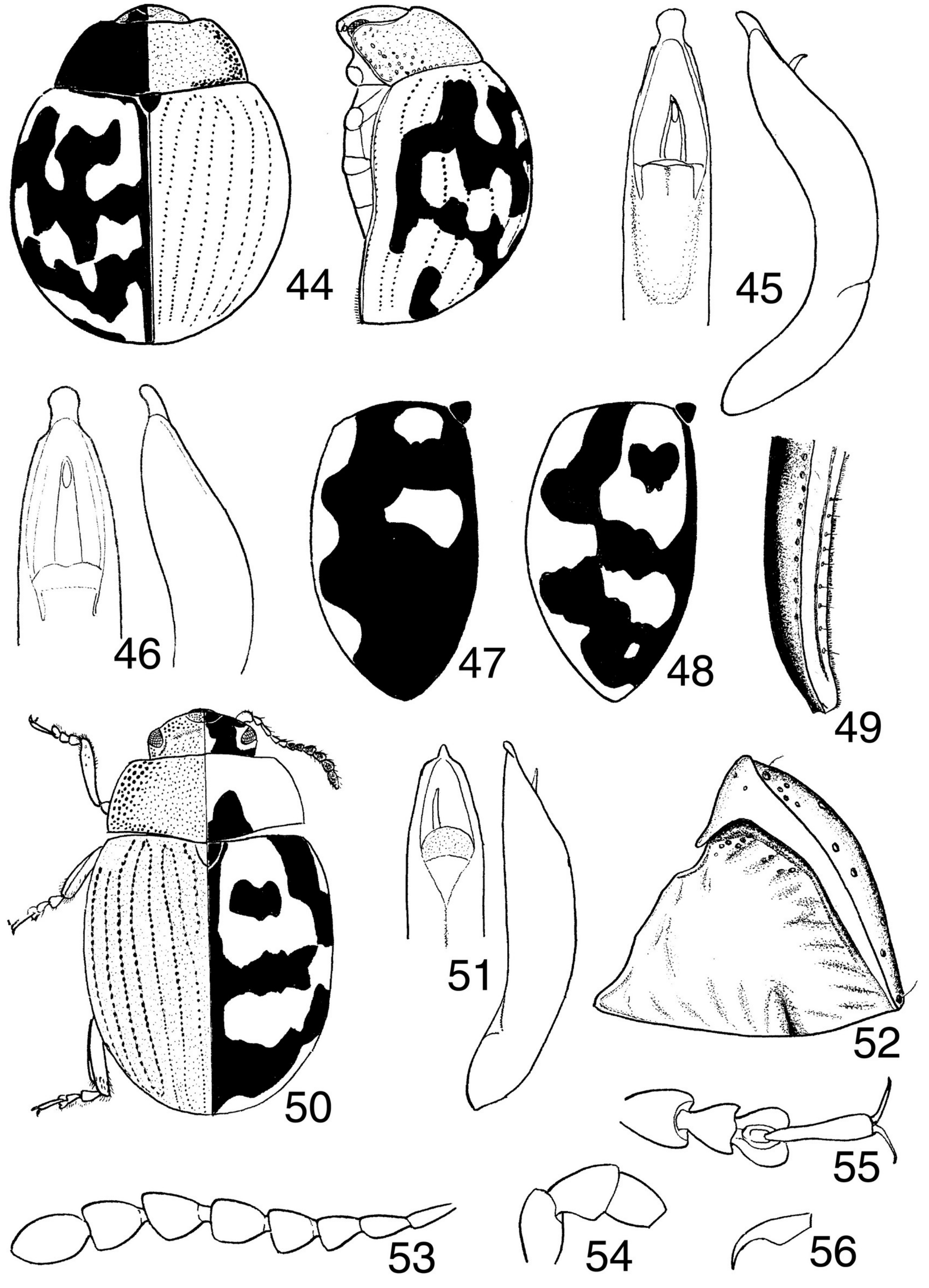


***Chersomela* figures 20–32** (S Africa): 20–21 – *Chrysolina duodecimguttata*, male, syntype: 20 – dorsal and lateral view, 21 – aedeagus; 22–28 – *Ch. eburnipennis*: 22 – female (*Chrysomela palliata*, syntype), left elytron, 23–28 – male: 23 – fore-tarsus, 24 – hind-tarsus, 25 – dorsal and lateral view, 26 – aedeagus, 27 – antenna, 28 – maxillary palpus; 29–32 – *Ch. figurata*, male: 29

– dorsal and lateral view, 30 – aedeagus, 31 – maxillary palpus, 32 – apical part of aedeagus, dorsal view (another specimen). (Orig.)

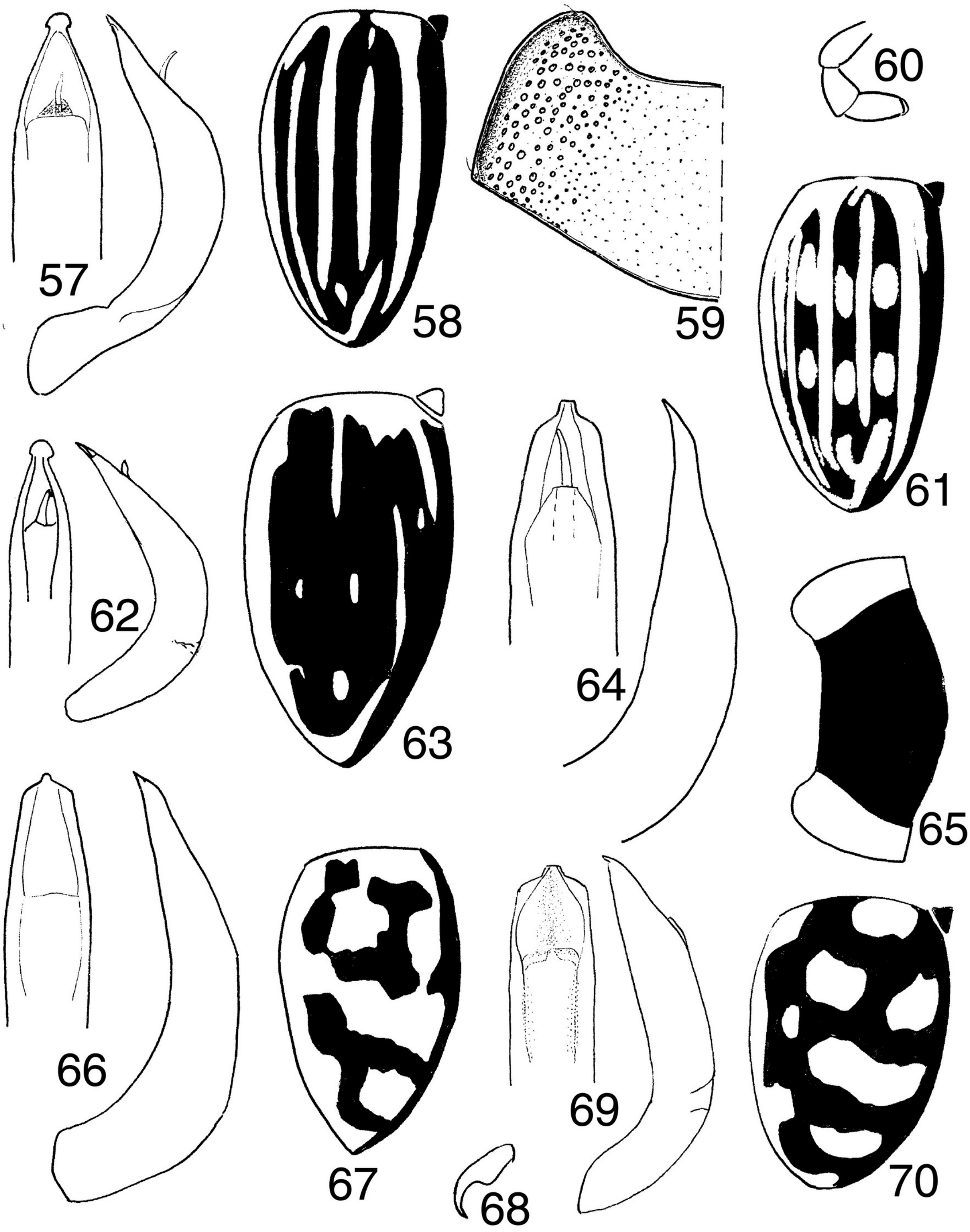


***Chersomela* figures 33–43** (S Africa): 33–35 – *Chrysolina figurata*, elytral pattern variability; 36–43 – *Ch. haemograpta*: 36–39 – male: 36 – dorsal and lateral view, 37 – maxillary palpus, 38 – fore-tarsus, 39 – aedeagus, 40 – aedeagus, another male, 41–43 – elytral pattern variability (41, 43 – males, 42 – female). (Orig.)



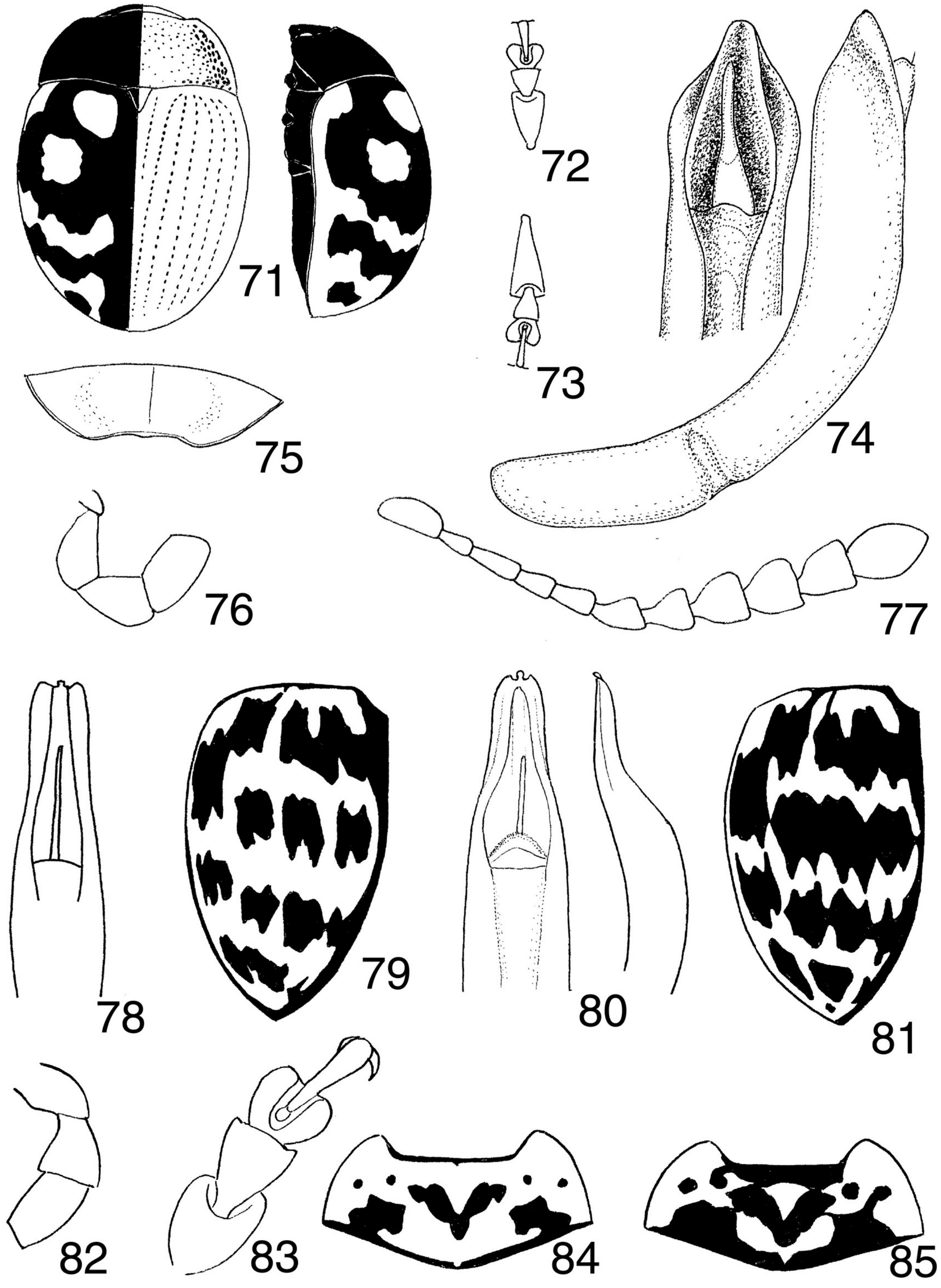
***Chersomela* figures 44–56**: 44–46 – *Chrysolina hebe* (Angola), males: 44 – dorsal and lateral view, 45 – aedeagus of non-type male, 46 – aedeagus (*Ch. tortuosa quangoensis*, syntype); 47–56 – *Ch. hottentotta* (Namibia): 47, 48 – females, variability of elytral pattern, 49 – male, epipleura of right elytron, ventral view, 50 – female, dorsal view, 51–56 – male: 51 – aedeagus, 52 –

prothoracic hypomeron, 53 – antenna, 54 – maxillary palpus, 55 – fore-tarsus, 56 – tarsal claw. (Orig.)

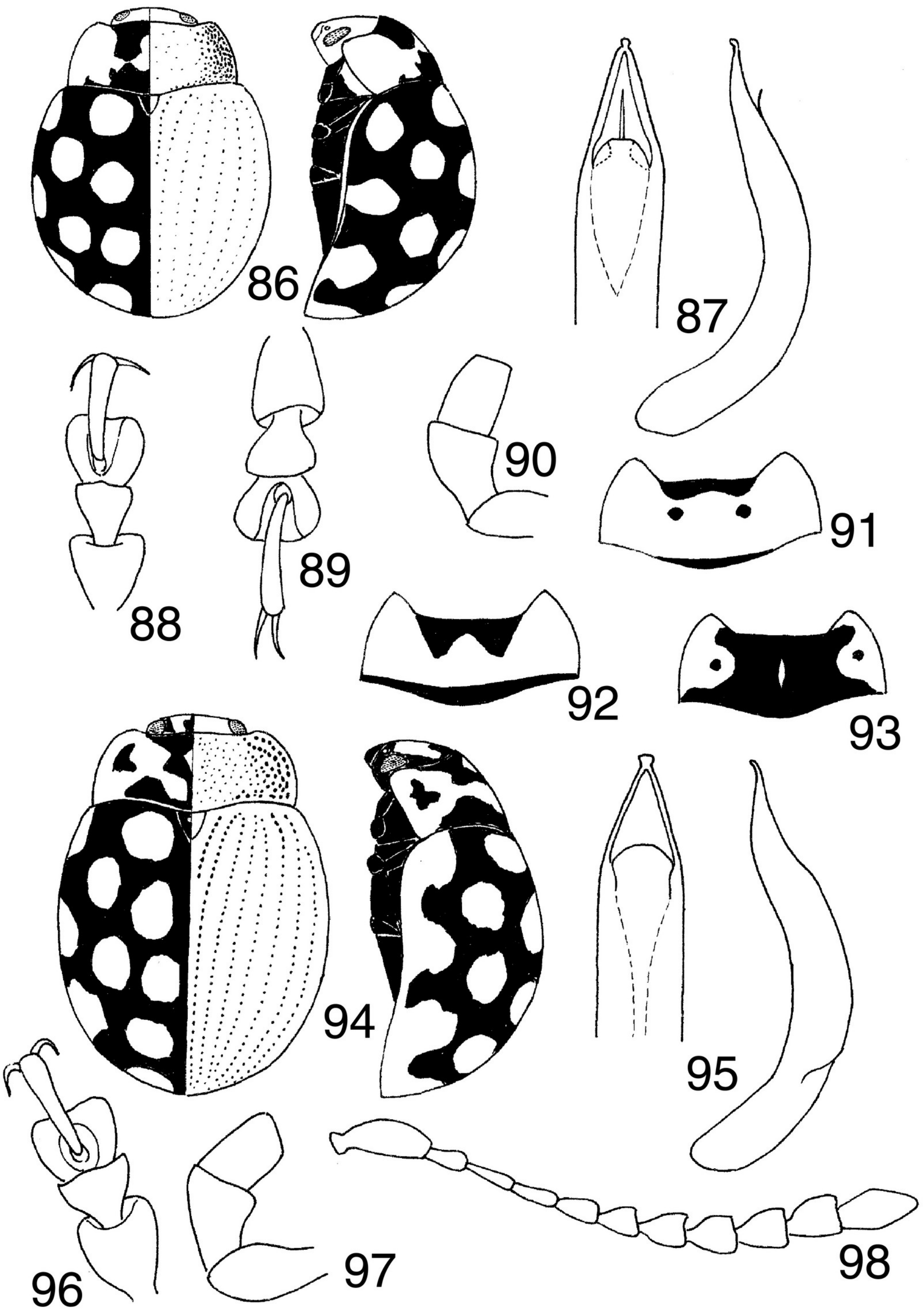


***Chersomela* figures 57–70** (S Africa): 57–62 – *Chrysolina lineoligera*: 57–60 – male: 57 – aedeagus, 58 – left elytron, 59 – pronotum, 60 – maxillary palpus, 61 – female, left elytron, variability of pattern, 62 – male (*Paropsis venustula*, type), aedeagus; 63–65 – *Ch. marshalli*, male (holotype): 63 – left elytron, 64 – aedeagus, 65 – pronotum; 66–70 – *Ch. modesta*, males: 66 – aedeagus, 67 –

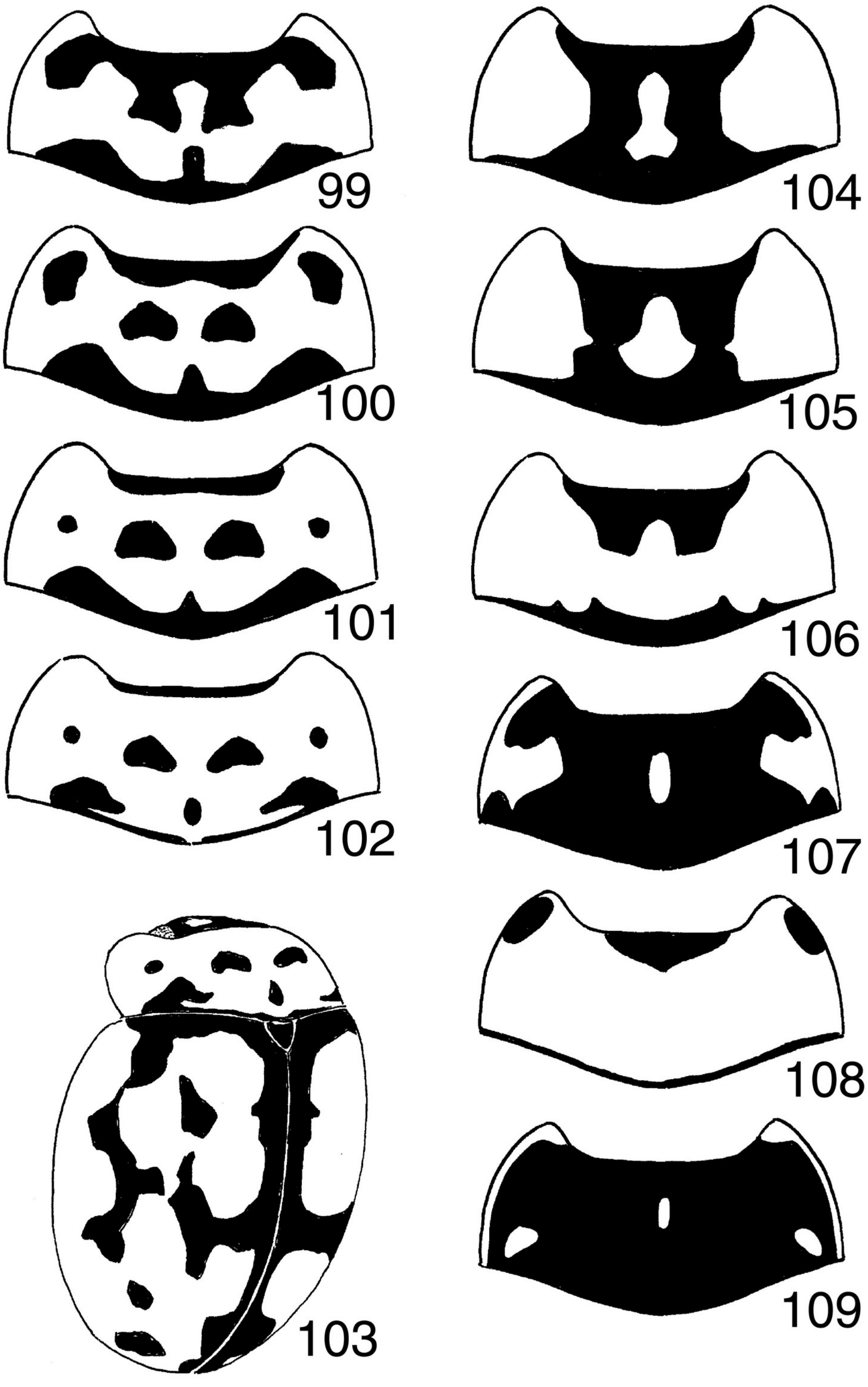
left elytron, 68 – tarsal claw, 69 – aedeagus, 70 – left elytron. (Orig. figures by M. Daccordi: 62, 63, 66, 67; others – figs. by the author)



***Chersomela* figures 71–85** (S Africa): 71–77 – *Chrysolina multifida*, male: 71 – total dorsal and lateral view, 72 – fore-tarsus, 73 – hind-tarsus, 74 – aedeagus, 75 – last abdominal sternite, 76 – maxillary palpus, 77 – antenna; 78–85 – *Ch. oberprieleri* Daccordi, in litt.: 78–79 – male (holotype): 78 – aedeagus, 79 – left elytron, 80–85 – males (paratypes): 80 – aedeagus, 81 – left elytron, 82 – maxillary palpus, 83 – fore-tarsus, 84, 85 – pronotum, variability of pattern. (Orig. figures by M. Daccordi: 78, 79; others – figs. by the author)



***Chersomela* figures 86–98**: *Chrysolina pardalina* (S Africa): 86–93: ab. *vigintiguttata*: 86–90 – male: 86 – dorsal and lateral view, 87 – aedeagus, 88 – fore-tarsus, 89 – hind-tarsus, 90 – maxillary palpus, 91–93 – pronotum, variability of pattern; 94–98 – ab. *pardalina*, male: 94 – dorsal and lateral view, 95 – aedeagus, 96 – fore-tarsus, 97 – maxillary palpus, 98 – antenna. (Orig.)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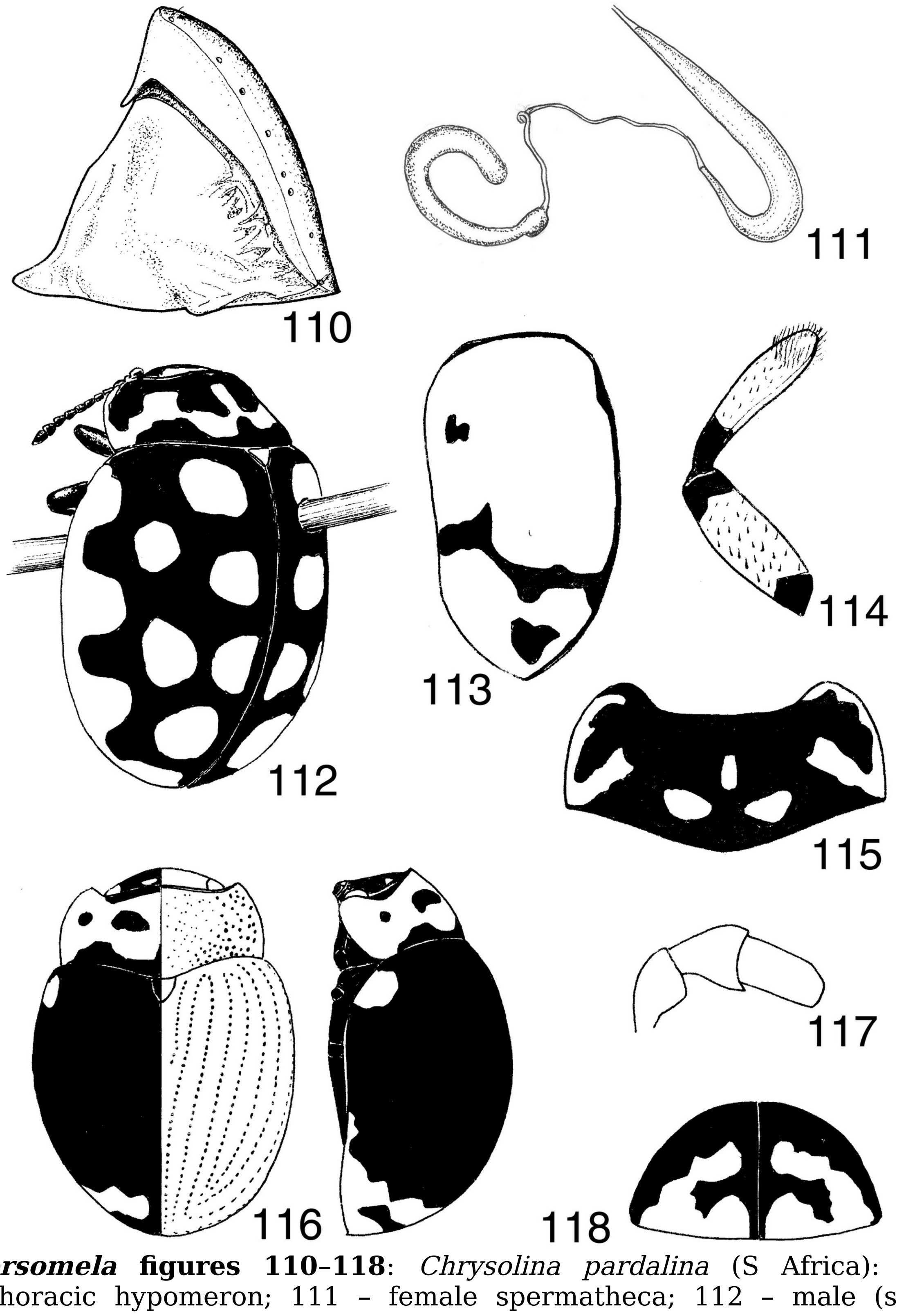
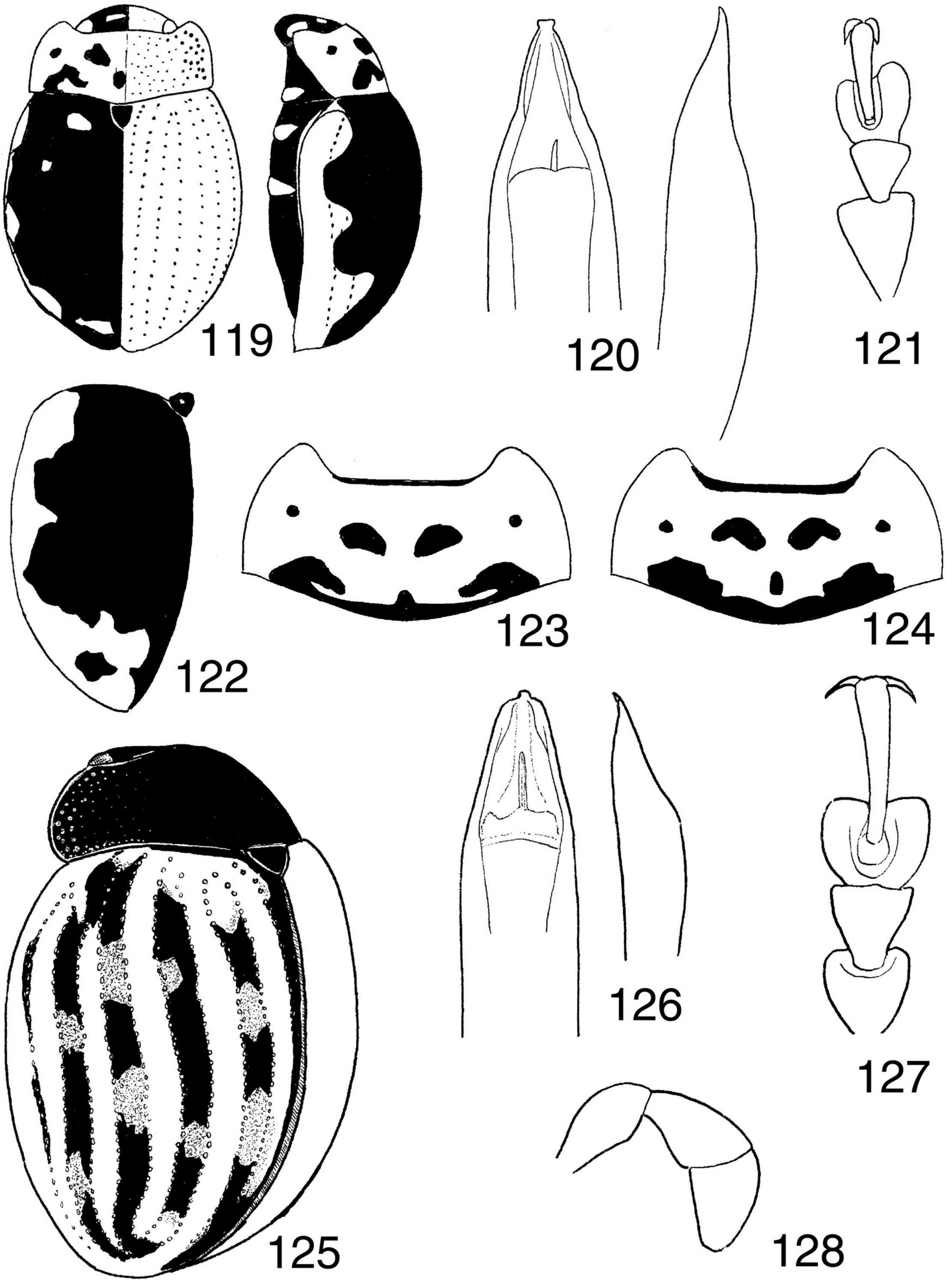
***Chersomela* figures 99–109**: *Chrysolina pardalina* (S Africa): 99–102 – ab. *pardalina*, pronotum, variability of pattern, 103 – ab. *subcruciata*, total view, 104–109 – ab. *vigintiguttata*, pronotum, variability of pattern. (Orig.)



***Chersomela* figures 110–118**: *Chrysolina pardalina* (S Africa): 110 – prothoracic hypomeron; 111 – female spermatheca; 112 – male (syntype *Chrysomela vigintipustulata*), total view; 113–115 – specimen (syntype *Coccinella undata*): 113 – left elytron, 114 – femur and tibia, 115 – pronotum; 116–118 – female, ab. *revestita*: 116 – dorsal and lateral view, 117 – maxillary palpus, 118 – elytra viewed from behind. (Orig. figures by M. Daccordi: 113–115; others – figs. by the author)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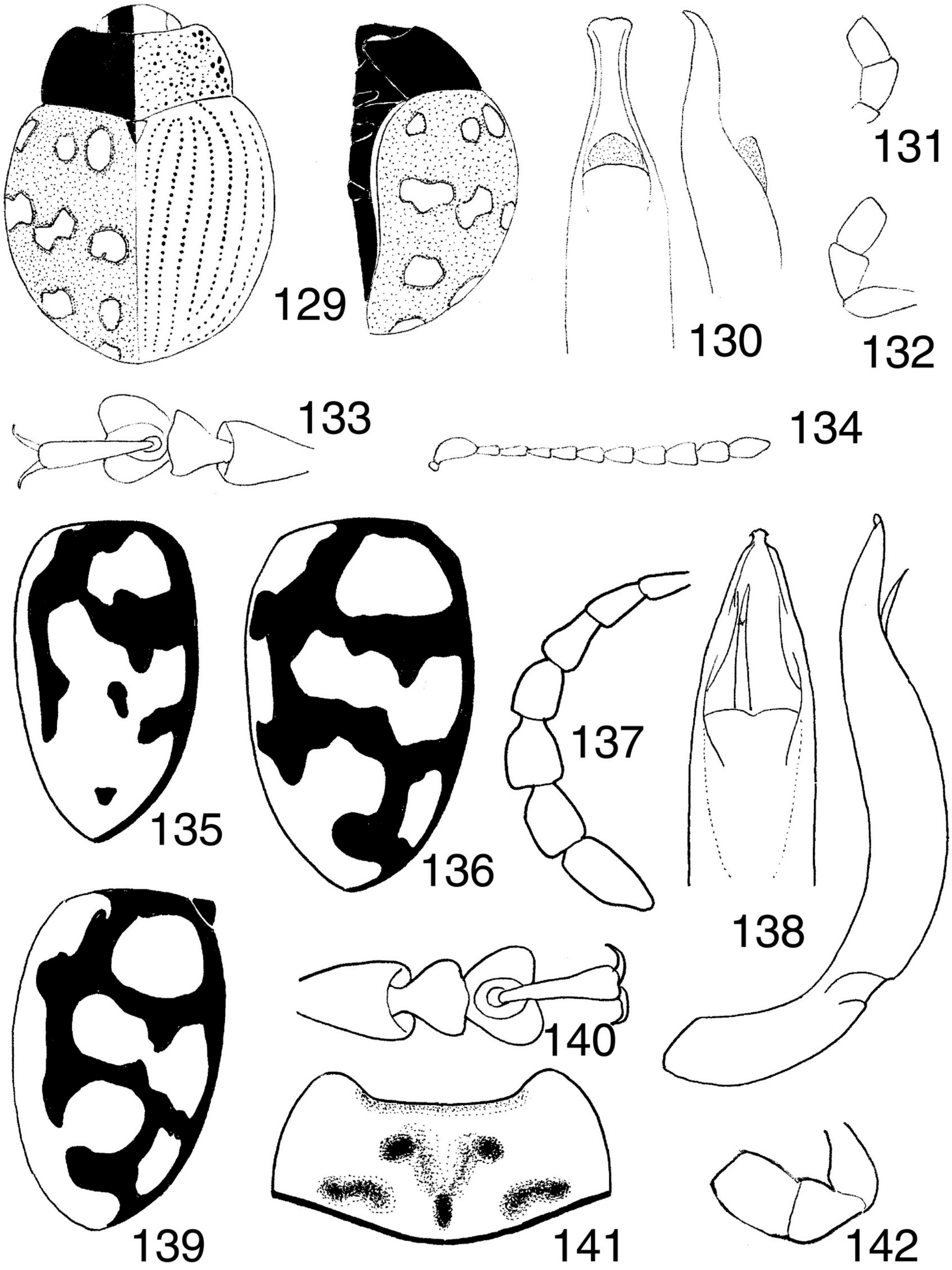
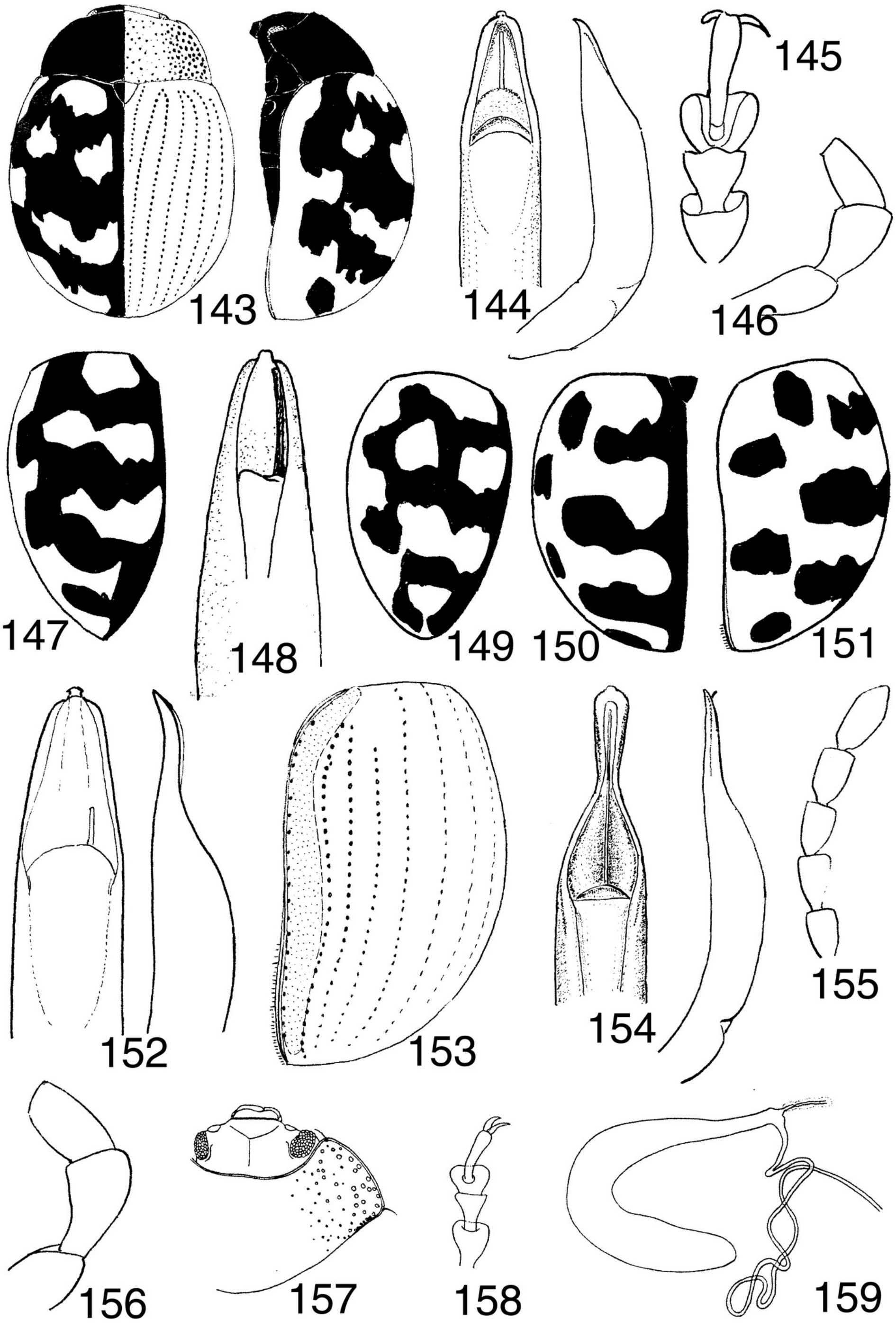
***Chersomela* figures 119–128** (S Africa): 119–124 – *Chrysolina pardalina* ab. *revestita*: 119–121 – male: 119 – dorsal and lateral view, 120 – aedeagus, 121 – fore-tarsus, 122 – left elytron, variability of pattern, 123–124 – pronotum, variability of pattern; 125–128 – *Ch. picturata*, male (syntype *Chrysomela catenata*): 125 – total view, 126 – aedeagus, 127 – fore-tarsus, 128 – maxillary palpus. (Orig.)



***Chersomela* figures 129–142** (S Africa): 129–134 – *Chrysolina polyops*: 129–131 – male: 129 – total dorsal and lateral view, 130 – aedeagus, dorsal and lateral view, 131 – maxillary palpus, 132–134 – female: 132 – maxillary palpus, 133 – fore-tarsus, 134 – antenna; 135–142 – *Ch. pulchella*: 135 – female (syntype *Polysticta pulchella*), left elytron, 136–137 – female (syntype *Atechna interruptofasciata*): 136 – left elytron, 137 – antenna, 138–142 – male: 138 – aedeagus, 139 – left elytron, 140 – fore-tarsus, 141 – pronotum, 142 –

maxillary palpus. (Orig. figures by M. Daccordi: 135, 136; others – figs. by the author)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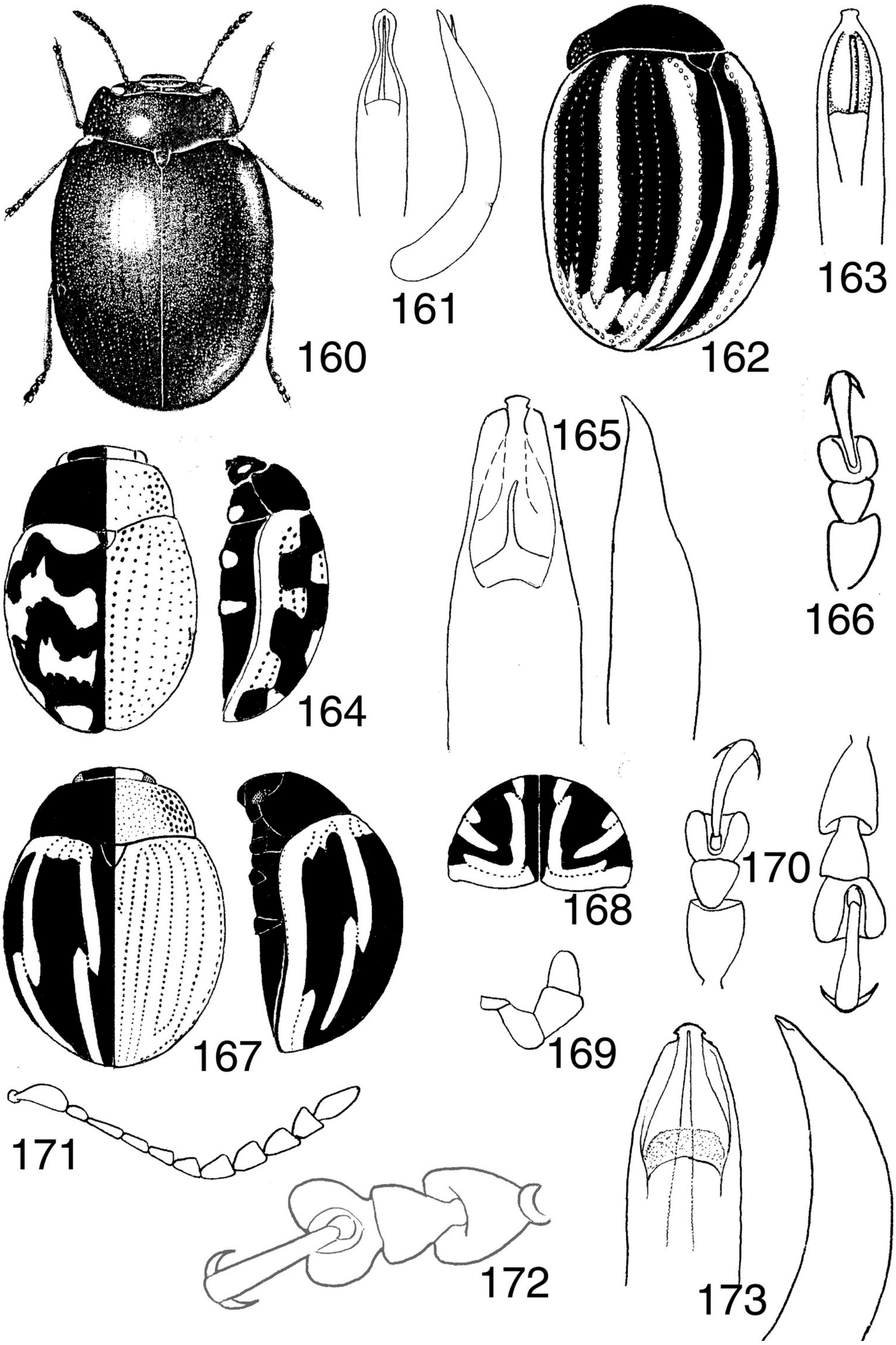
***Chersomela* figures 143–159** (S Africa): 143–149 – *Chrysolina repanda*: 143 – female, dorsal and lateral view, 144–146 – male: 144 – aedeagus, 145 – foretarsus, 146 – maxillary palpus, 147 – male (syntype *Chrysomela repanda*), left elytron, 148–149 – male (syntype *Chrysomela cribrosa* Thunberg): 148 – aedeagus, 149 – left elytron; 150–152 – *Ch.* sp. 55 prope *repanda*, male: 150, 151 – left elytron, dorsal and lateral view, 152 – aedeagus; 153–159 – *Ch.*

scotti: 153–156 – male (paratype): 153 – left elytron, lateral view, 154 – aedeagus, 155 – antennomeres 7–11, 156 – maxillary palpus, 157, 158 – male (holotype): 157 – head and pronotum, 158 – fore-tarsus, 159 – female (paratype), spermatheca. (After: Daccordi, 2001: 157–159; orig. figures by M. Daccordi: 147–149; others: figs. by the author)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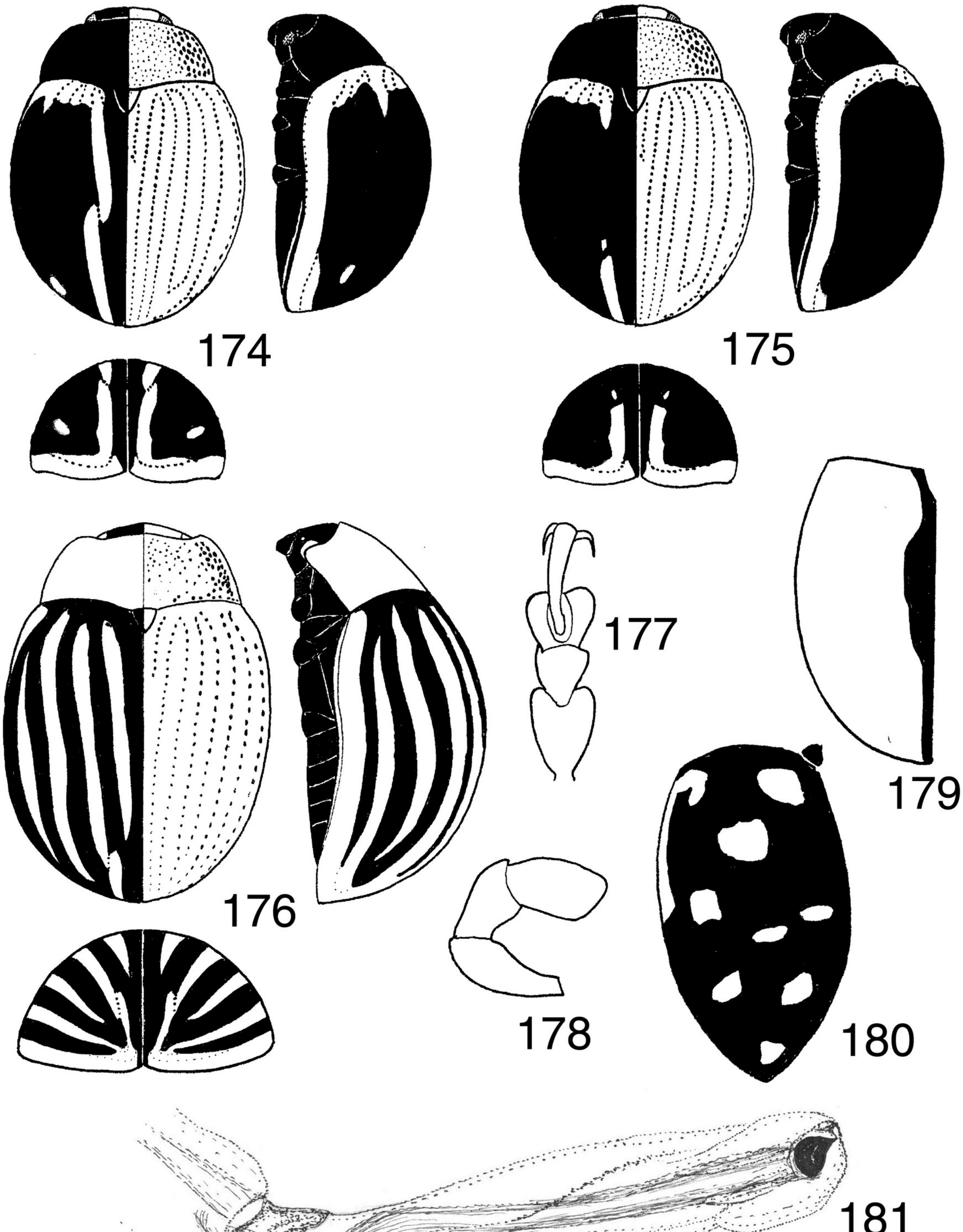
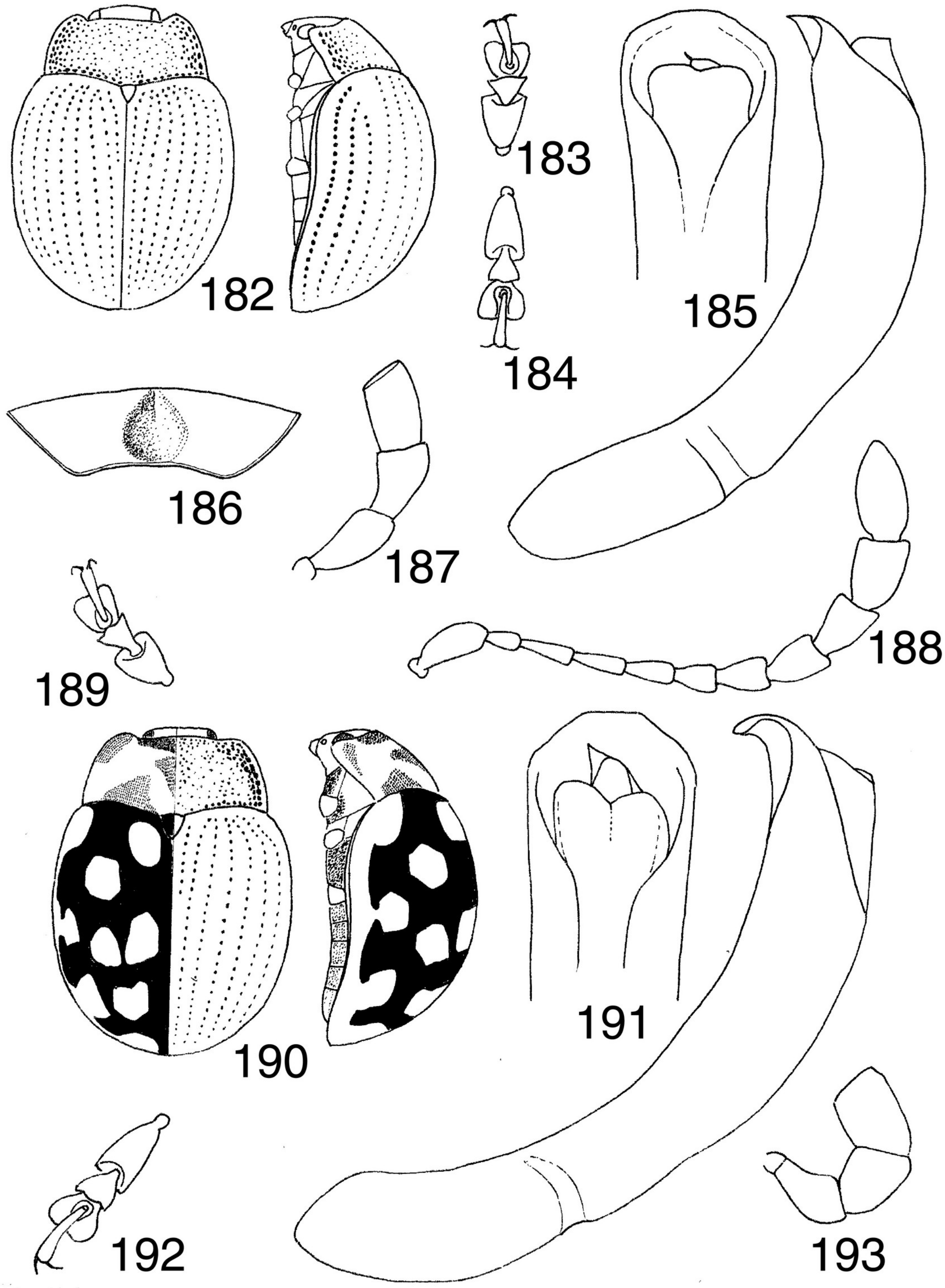
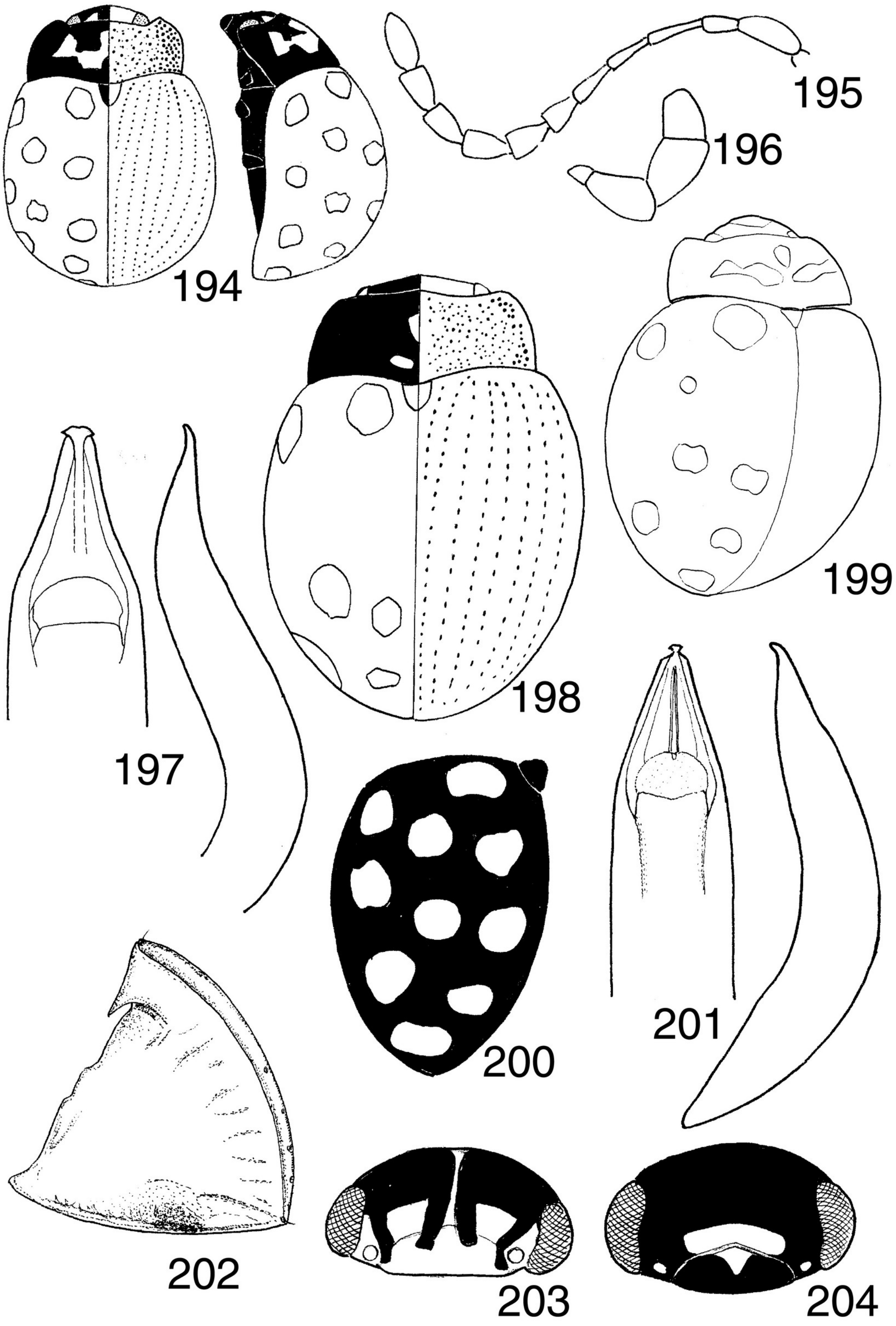
Chersomela **figures 160–173** (S Africa): 160–161 – *Chrysolina scotti*: 160 – dorsal view, 161 – male (holotype), aedeagus; 162–163 – *Ch. sexlineata*, male (syntype): 162 – total view, 163 – aedeagus; 164–166 – *Ch. repanda*, male: 164 – dorsal and lateral view, 165 – aedeagus, 166 – hind-tarsus; 167–173 – *Ch. soluta*: 167–172 – female: 167 – dorsal and lateral view, 168 – elytra from behind, 169 – maxillary palpus, 170 – fore- and hind-tarsus, 171 – antenna, 172–173 – male: 172 – fore-tarsus, 173 – aedeagus. (After: Adair, Scott, 1991: 160; Daccordi, 2001: 161; orig. figure by M. Daccordi: 163; others: figs. by the author)



***Chersomela* figures 174–181** (S Africa): 174–175 – *Chrysolina soluta*, dorsal and lateral view, and elytra from behind, variability of pattern; 176–178 – *Ch. taeniolata*, female: 176 – dorsal and lateral view, and elytra from behind, 177 – fore-tarsus, 178 – maxillary palpus; 179–181 – *Ch. tricolor*: 179 – male (holotype), left elytron, rare variation of coloration, 180 – male, left elytron, 181 – flagellum of aedeagus. (Orig.)



***Chersomela* figures 182–193** (S Africa): 182–188 – *Chrysolina tricolor* ab. *africana*, male: 182 – total dorsal and lateral view, 183 – fore-tarsus, 184 – hind-tarsus, 185 – aedeagus, 186 – last abdominal sternite, 187 – maxillary palpus, 188 – antenna; 189–193 – *Ch. tricolor*, male: 189 – fore-tarsus, 190 – total dorsal and lateral view, 191 – aedeagus, dorsal and lateral view, 192 – hind-tarsus, 193 – maxillary palpus. (Orig.)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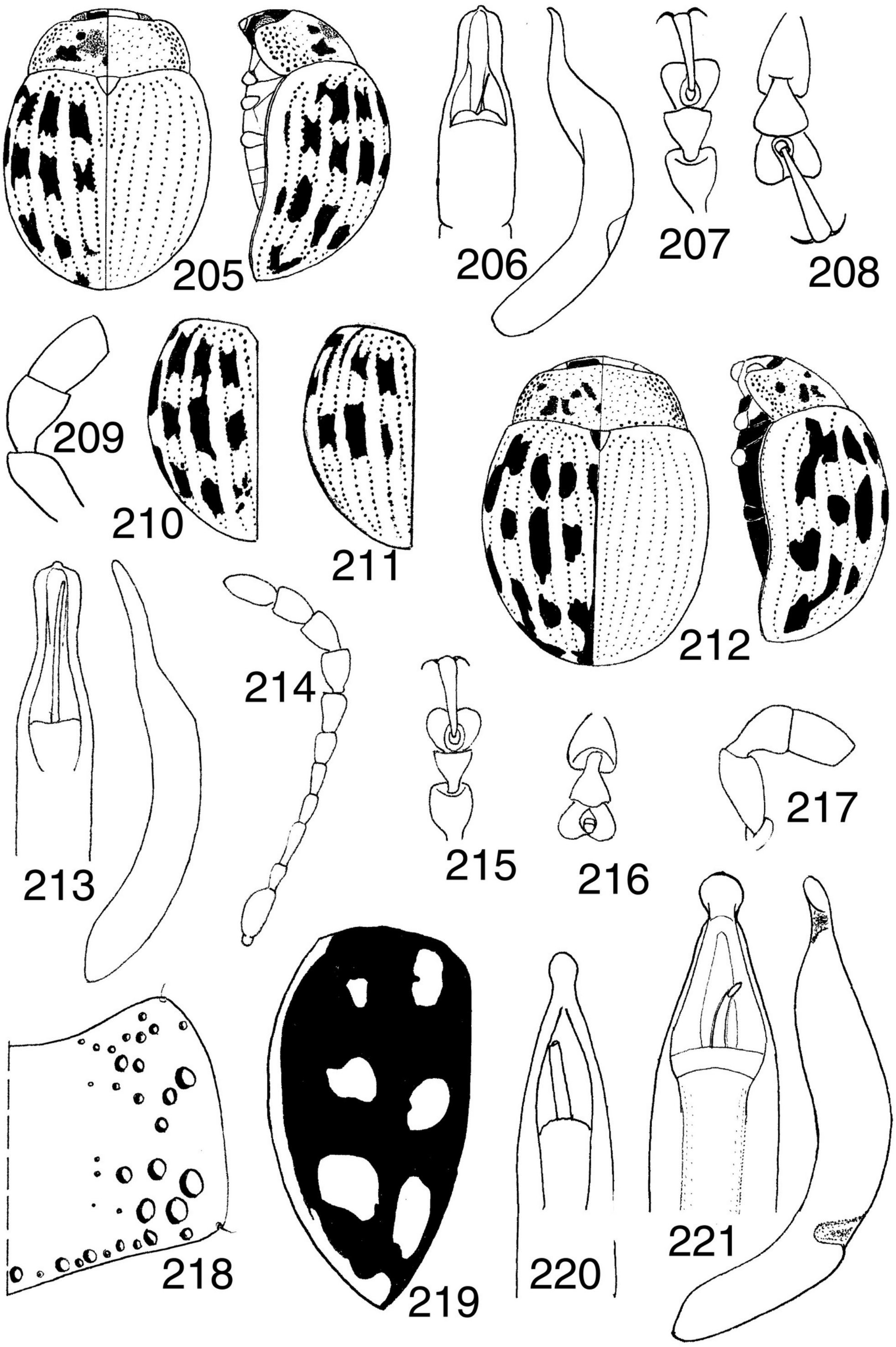
***Chersomela* figures 194–204** (S Africa): 194–199 – *Chrysolina vigintimaculata*: 194–195 – male: 194 – total dorsal and lateral view, 195 – antenna, 196 – female, maxillary palpus, 197 – male, aedeagus, dorsal and lateral view, 198 – female, dorsal view, 199 – rare color variation; 200–201 – *Ch*. sp. 56 prope *vigintimaculata*, male: 200 – left elytron, 201 – aedeagus;

202–204 – *Ch. vigintiquatuorsignata*: 202 – prothoracic hypomeron, 203–204 – head, variability of pattern. (Orig.)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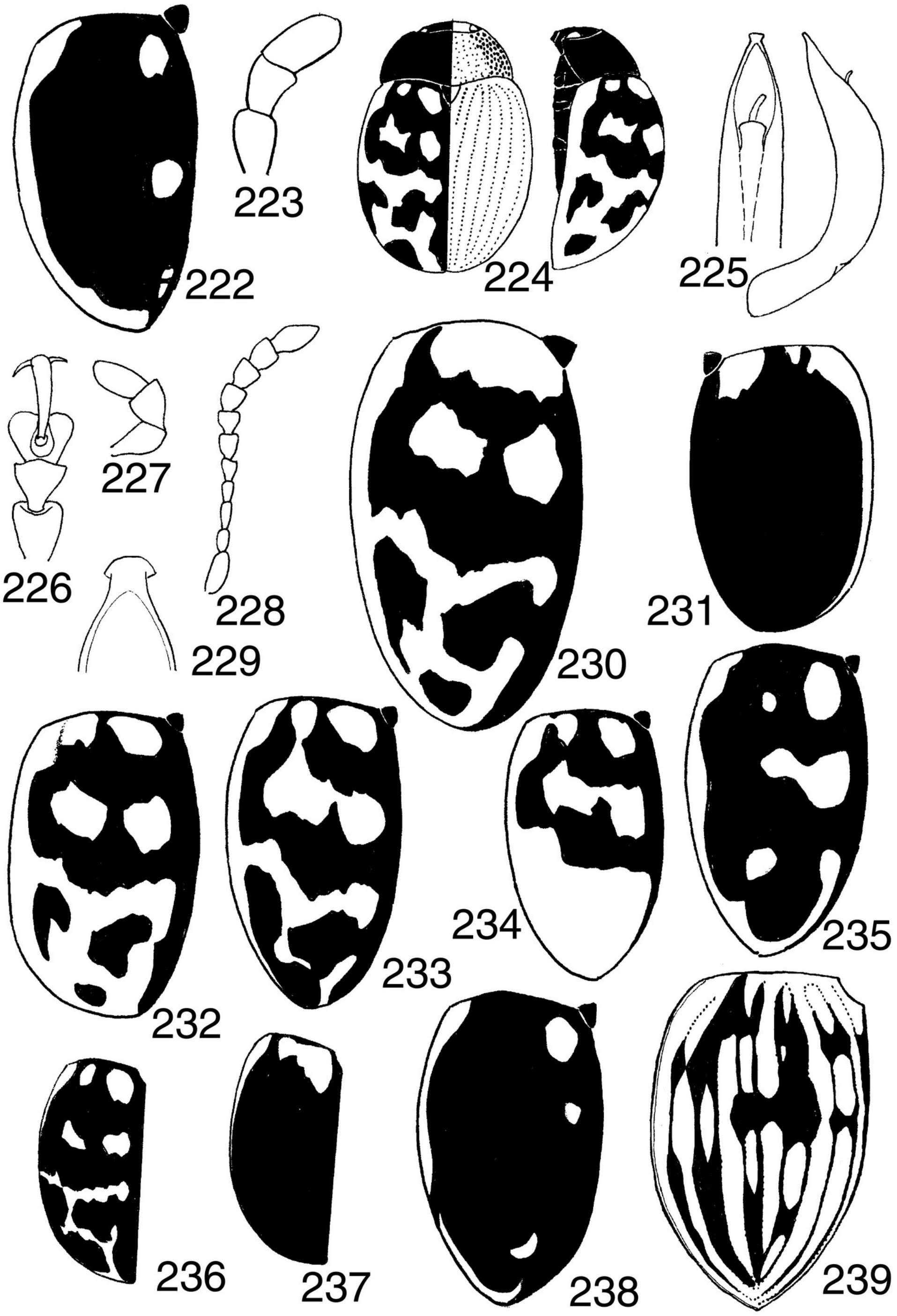
***Chersomela* figures 205–221** (S Africa): 205–211 – *Chrysolina vigintiquatuorsignata*: 205–209 – male: 205 – dorsal and lateral view, 206 – aedeagus, 207 – fore-tarsus, 208 – hind-tarsus, 209 – maxillary palpus, 210–211 – left elytron, variability of pattern; 212–217 – *Ch*. sp. 57: 212 – dorsal and lateral view, 213 – aedeagus, 214 – antenna, 215 – fore-tarsus, 216 – hind-tarsus, 217 – maxillary palpus; 218–221 – *Ch. vulpecula*: 218–220 – male (syntype): 218 – pronotum, right side, 219 – left elytron, 220 – aedeagus, 221 – male, aedeagus. (Orig. figures by M. Daccordi: 219, 220; others: figs. by the author)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***Chersomela* figures 222–239** (S Africa): 222–223 – *Chrysolina vulpecula*, male: 222 – left elytron, 223 – maxillary palpus; 224–238 – *Ch. vulpina*: 224–228 – male: 224 – dorsal and lateral view, 225 – aedeagus, 226 – fore-tarsus, 227 – maxillary palpus, 228 – antenna, 229 – another male, apex of aedeagus, dorsal view, 230 – female (syntype *Chrysomela ebraea*), left elytron, 231 – right elytron (syntype *Chrysomela bipustulata*), 232–233 – females (syntypes *Chrysomela coccinelloides*), left elytron, 234 – male (syntype *Chrysomela octopustulata*), left elytron, 235–238 – left elytron, variability of pattern; 239 – *Ch. marshalli*, female (holotype *Ch. lineolata*), left elytron. (Orig.)

Subgenus *Chrysocrosita* Bechyné, 1950a

Diagnosis

Dorsum black or metallic, unicolorous or pronotum and elytra (or elytra only) bicolorous or tricolorous.

Last maxillary palpomere as long as broad or slightly broader than long, similar in both sexes or broader in male, than in female.

Antenna inserted closer to clypeus than to eye.

Pronotum mostly broadest near mid-length, laterally swollen along entire length. Lateral impression obsolete to moderately deep, covered by large punctures along entire length, or furrow-shaped in basal ⅓ in some species. Anterior side of pronotum marginated, with setae in most species, without setae in *Ch. nikolskyi*. Anterior setiferous pore absent.

Prothoracic hypomeron more or less convex, basal fold present.

Metasternum entirely marginated anteriorly.

Humeral calli weak or absent. Hind wings absent or reduced, as long as metathorax. Elytral punctures dense and mostly confused, rarely elytron with 2 smooth, flat or slightly convex longitudinal bands, limited by undulate puncture rows, or irregular puncturation interrupted by 10 longitudinal convex calli.

Pygidium with distinct furrow along entire length.

Last abdominal sternite mostly evenly convex in both sexes.

In male tarsomeres 1–3 broad, especially in fore- and mid-tarsi; in female tarsomeres 1–3 narrow, at least tarsomere 1 with broad glabrous stripe beneath in all tarsi. Claw tarsomere without denticles beneath.

Aedeagus depressed dorso-ventrally in cross-section, evenly curved in lateral view, with parallel sides in dorsal view. Apex broadly truncate, or rounded, or {-shaped, mostly with 2 denticles at ventral side. Flagellum narrow, simple, hardly exposed.

Differential diagnosis

Chrysocrosita is closely related to *Lithopteroides* Strand, 1935, *Medvedevlevna* Özdikmen, 2008, and *Pseudolithoptera* L. Medvedev, 1970. It differs from *Lithopteroides* in hind wings absent or reduced, and in the absence of rounded glabrous spots on elytra, from *Medvedevlevna* in pygidium with distinct furrow along entire length, and prothoracic basal fold present, from *Pseudolithoptera* in pygidium with distinct furrow along entire length, and aedeagus without narrow apical projection. Several species of the subgenus *Chrysocrosita*, namely *Ch. alaschanica*, *Ch. jakowlewi*, *Ch. sogdiorum*, *Ch. concinna*, and *Ch. sulcicollis*, externally look like some members of the genus *Crosita* Motschulsky, 1860a and differ from them in posterior tarsomere 3 without deep apical emargination. Besides that, *Ch. concinna* slightly resembles some members of the subgenus *Bittotaenia* Motschulsky, 1860a and differs in elytra entirely confusedly punctate at whole surface, and hind wings absent.

Key to species and subspecies

1(4) In male tarsomere 1 of all tarsi and tarsomere 2 of hind-tarsi with glabrous stripe beneath (Fig. 6: *ja, co*). Pronotal lateral impression distinct along entire length, furrow-shaped in basal ⅓.

2(3) Pronotum and elytra red, distinctly circumscribed by golden green, green, or blue. Aedeagus: apical denticles almost invisible in dorsal view (Fig. 3: 1).

Dorsum dull, except head and pronotal lateral calli which are moderately shining, or head and pronotum shining, elytra dull. Head golden red medially and green laterally, or green with golden red spots on vertex, with posterior margin, labrum, clypeus, and orbits violet, or violet with golden green medial spot; pronotum red, narrowly margined anteriorly, laterally, and posteriorly with violet, with lateral calli green, lateral impression in basal ⅓ violet, or pronotum red (with blackish medial spot), margined anteriorly, posteriorly and along lateral impressions by green, with lateral impressions and calli violet; scutellum entirely violet, or with green medial spot; elytra red, sometimes blackish medially, with suture and lateral stripe golden green, or with suture violet, lateral stripe blue, narrow lateral margin and epipleura violet, or each elytron entirely margined by violet: broad lateral band, narrow basal and sutural stripes; legs, maxillary palpi, underside, and antennae violet, antennomeres 1 and mostly 2 rufous apically; pygidium rufous with apex violet. Length: 7.3–7.4 mm (males), 7.8–9.2 mm (females). Figs. 3: 4, 5; 6. Sayans, Tuva.

Ch. jakowlewi (Weise, 1894b)

3(2) Dorsum usually dark blue or blackish blue, rarely green with golden bronze reflection or golden red, with head, pronotum, and elytra narrowly diffusely margined by golden green. Aedeagus: apical denticles projected beyond lateral margin, distinctly visible in dorsal view (Fig. 3: 2).

Dorsum weakly shining or dull. Body including antennae and legs dark blue or blackish blue; rarely body green with golden bronze reflection dorsally, with epipleura, underside, and legs violet or golden red, with head, pronotum, and elytra narrowly margined with golden green, epipleura and underside blue, legs violet. Antennomeres 1 and 2

rufous apically, pygidium rufous basally. Length: 6.4–7.9 mm (males), 8.1–10.0 mm (females). Figs. 1: 7, 8; 6. Altai, Tuva, Sayans, N Mongolia.
Ch. concinna (Weise, 1894b)

4(1) In male tarsomeres 1–3 with entire sole or only hind tarsomere 1 with narrow glabrous stripe near base (Figs. 5; 6: *sp, fu*). Pronotal lateral impression distinct along entire length or more or less reduced, obsolete.

5(16) Pronotal lateral impression shallow to obsolete in anterior ½.

6(7) Pronotum green, blue, or violet, elytra red, each circumscribed by green or blue.

Dorsum moderately shining, in females elytra sometimes dull. Coloration variable, head, antennae, palpi, pronotum, scutellum, underside, legs, epipleura, elytral sutural stripe, and usually elytral lateral stripe green, blue, bluish green, or violet, elytra purple, sometimes with blackish discal stripe. Length: 6.3–6.8 mm (males), 7.3–8.7 mm (females). Figs. 1: 5, 6; 2: 5; 6. S Siberia, Far East, N Mongolia.
Ch. spectabilis (Motschulsky, 1860a)

7(6) Dorsum entirely dark bronze (black with bronze lustre), dark blue, dark violet, green (with or without blue or olive green reflection), or golden red (in the last case dorsal view lateral sides of pronotum and elytra look like golden green, in lateral view head, pronotum, and elytra medially look like golden green).

8(11) Pronotal lateral impression deep, furrow-shaped in basal ⅓.

9(10) Dorsum moderately shining or dull. Body including legs and antennae dark blue, dark violet, or body golden red (in dorsal view, lateral sides of pronotum and elytra look like golden green; in lateral view, head, pronotum and elytra medially look like golden green), labrum, scutellum, underside, legs, and antennae golden green; antennomeres 1 and 2 rufous apically on underside, pygidium rufous, darkened apically. Aedeagus broadly truncate (Fig. 2: 3). Length: 6.5–7.8 mm (males), 7.1–9.2 mm (females). Figs. 3: 7, 8; 5. Kyrghyzstan.
Ch. sogdiorum (Weise, 1892a)

10(9) Dorsum moderately shining or with dull elytra. Dorsum entirely dark bronze, or with pronotal borders and lateral calli violet, legs violet, antennomeres 1 and 2 rufous ventrally. Aedeagus with apex trapezoidal and bearing small apical projection. (See also couplet 15). C China.
Ch. josefi Daccordi et Ge, 2009

11(8) Pronotal lateral impression broad and very shallow in basal ¾. Dorsum bronze, green, blue, or violet.

12(13) Dorsum dark violet, rarely dark green, pronotum with weak bronze reflection. One specimen from Korea is dark violet with bronze reflection dorsally. Male fore- and mid-tarsomeres 1–3 strongly broadened. Aedeagus parallel-sided (Figs. 1: 12; 2: 6). Species from the Far East.
Ch. nikolskyi (Jacobson, 1898)

Three subspecies:

(a) subsp. *nikolskyi*. Sakhalin, S Kuriles, Japan. It differs from the subspecies *adzhalamica* in pronotal lateral impressions broad, very shallow to moderately deep, evenly impressed along entire length or, at least, in basal ¾. It differs from the subspecies *sutschanica* in elytral punctures dense, fine, becoming finer posteriorly in male, or being obsolete in posterior ½ (and sometimes in anterior ½ too) in female. Length: 6.6–7.7 mm (males), 8.7–9.3 mm (females). Figs. 1: 10; 2: 6; 3: 9, 10; 5.

(b) subsp. *adzhalamica* L.Medvedev, 1970. Khabarovsk Krai. It differs from both, *nikolskyi* s.str. and *nikolskyi sutschanica* in the shape of pronotal lateral impression which is obsolete, almost absent along most of its length, but slightly deepened anteriorly, and forming narrow shallow furrow with (or without) large punctures in basal ¼ (however, this impression is much shallower, and basal furrow shallower and shorter than in *Ch. sulcicollis solida*. Length: 6.7–6.8 mm (males); 8.3–9.0 mm (females). Aedeagus – fig. 1: 12.

(c) subsp. *sutschanica* L.Medvedev, 1970. Primorsky Krai, Korea. It differs from the nominotypical subspecies in elytral punctures some larger, distinct till elytral apex in both sexes (in female of the nominotypical subspecies, elytral punctures obsolete in posterior ½, sometimes also in anterior ½). Length: 6.7–8.7 mm (males); 8.8–10.6 mm (females). Aedeagus – fig. 4: 1, 2.

13(12) Dorsum bronze, green, blue, or violet. Species from China.

14(15) Species from N-W China. Dorsum steel blue to bluish green, or head and pronotum green with golden tint, and elytra olive green (nominotypical subspecies), or dorsum golden green to red cupreous (subspecies *alta*). Male fore- and mid-tarsomeres 1–3 moderately broadened. Aedeagus with apex obtusely triangular. Length: 6.8–8.5 mm (males); 8.5–9.5 mm (females). Figs. 4: 3–8; 6. There are two subspecies.
Ch. fuyunica Chen, 1961

15(14) Species from C China. Dorsum bronze (black with bronze lustre), or with pronotal borders and lateral calli violet; legs violet, antennomeres 1 and 2 rufous ventrally. Male fore- and mid- tarsomeres 1 and 3 moderately enlarged. Female fore-tarsomere 1 with narrow glabrous stripe in basal ½, mid- and hind-ones – along entire length. Aedeagus with apex trapezoidal and bearing small apical projection. Length 6.2–8.6 mm. Fig. 7.
Ch. josefi Daccordi et Ge, 2009

16(5) Pronotal lateral impression deep along entire length, furrow-shaped in basal ⅓ (Fig. 1: 1).

17(18) Elytron with large, dense, irregular puncturation interrupted by 10 convex longitudinal calli; punctures between calli arranged in 2–3 irregular rows. Dorsum black. Length 8.0–11.0 mm. Figs. 1: 1, 2, 9; 2: 4; 3: 6; 5. China (Gansu, Inner Mongolia).
Ch. alaschanica (Jacobson, 1898)

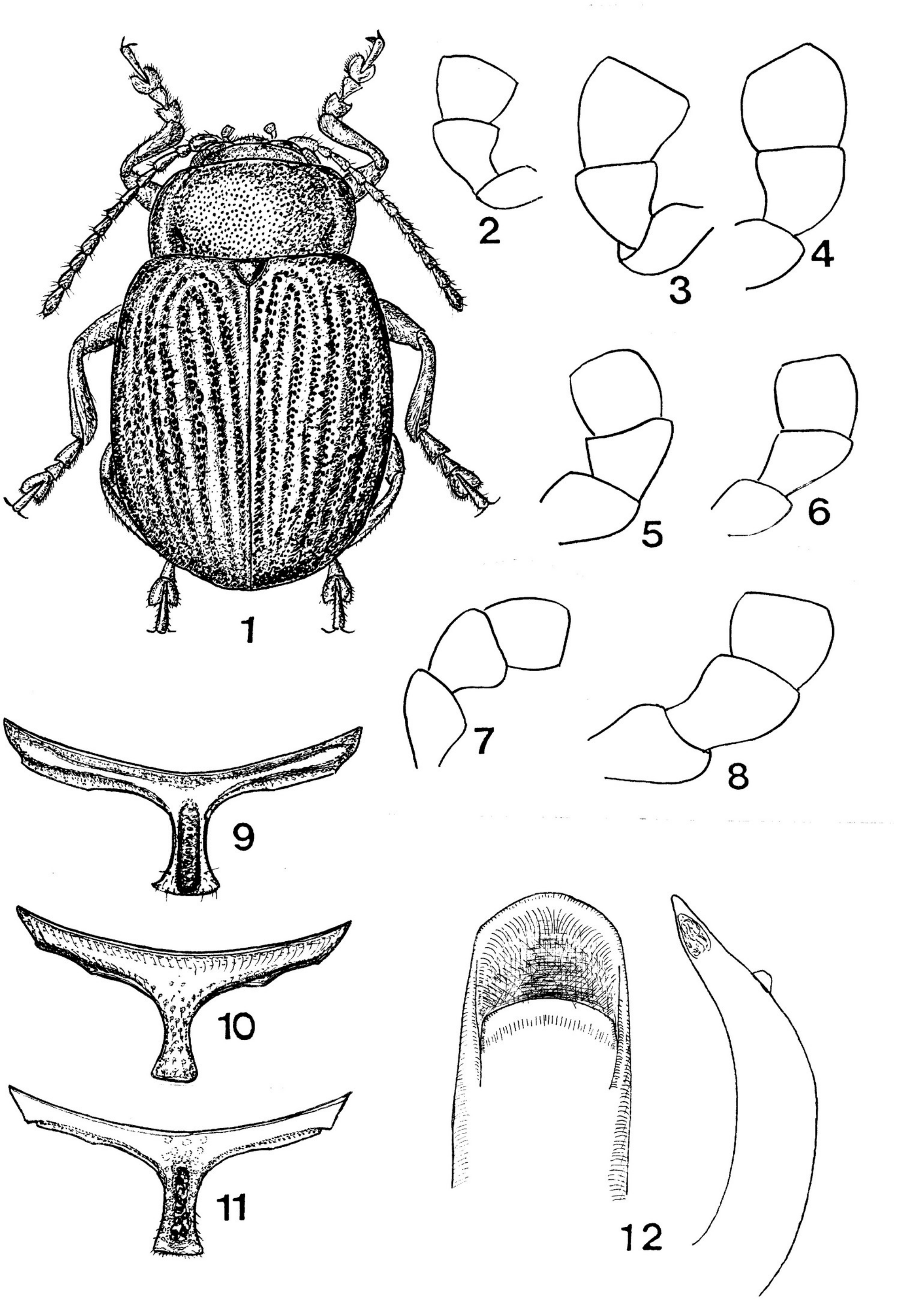
18(17) Elytron entirely confusedly punctate, or with 2 smooth, flat or slightly convex longitudinal bands among confuse puncturation. Dorsum blackish bronze, sometimes with head violet, or entirely dark blue or dark violet.
Ch. sulcicollis (Fairmaire, 1887)

Three subspecies:

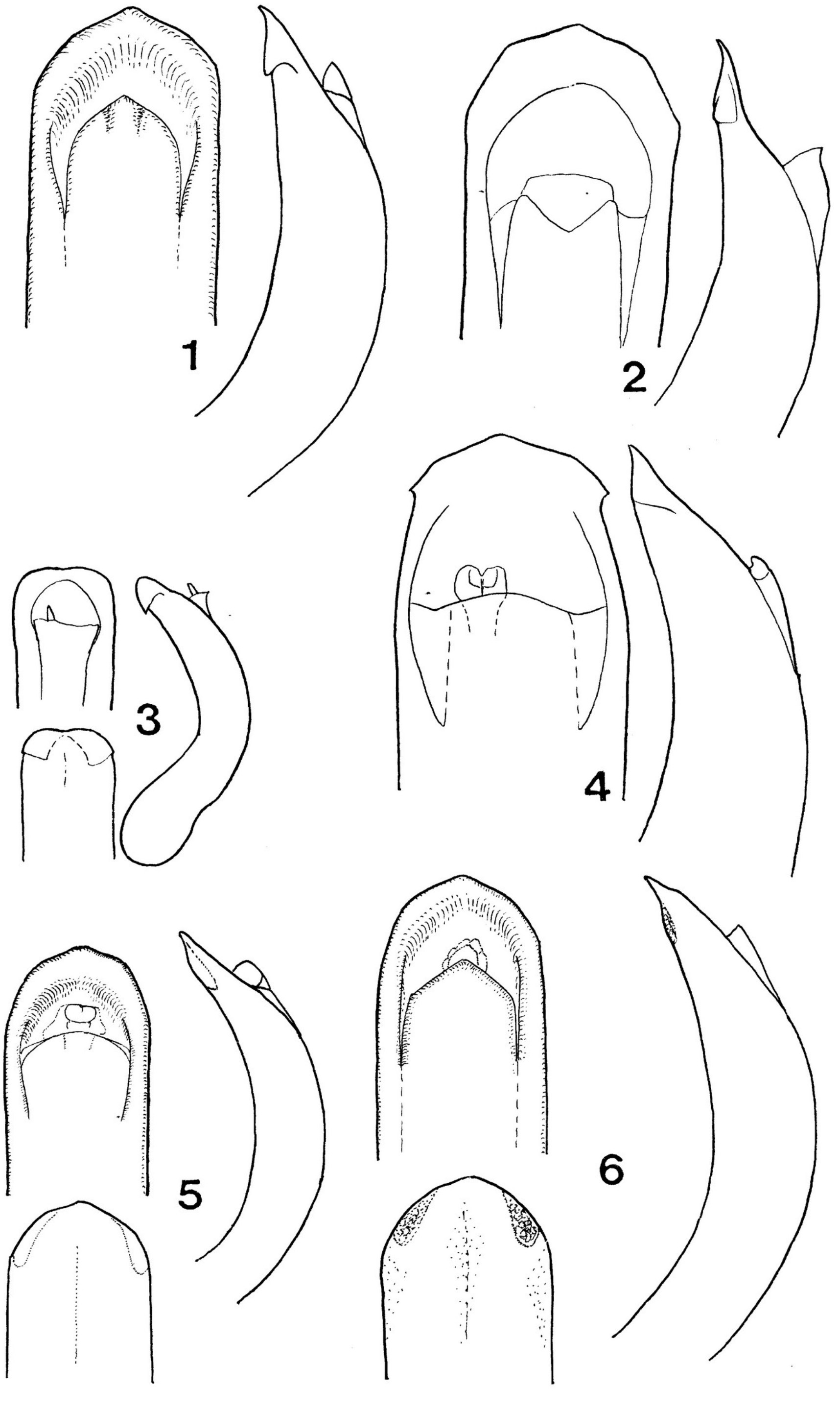
(a) subsp. *sulcicollis*. N-E China. It differs from the subspecies *przewalskyana* in elytral puncturation moderately large, not coarse, becoming slightly finer posteriorly; intervals between punctures flat. It differs from the subspecies *solida* in dorsal coloration: blackish bronze, with only lateral margins of pronotum and elytra, pronotal impressions in basal ⅓, and sometimes head violet. Length: 6.7–7.4 mm (males), 8.1–9.2 mm (females). Figs. 1: 3, 4, 11; 2: 1; 5.

(b) subsp. *przewalskyana* Kippenberg, 2010. China (Inner Mongolia). This subspecies differs from the nominotypical one in elytra coarsely punctate with intervals distinctly wrinkled. Aedeagus as in Fig. 2: 2.

(c) subsp. *solida* (Weise, 1898). Korea. This subspecies differs from the nominotypical one in the color of body: dark blue or dark violet dorsally, and in the aedeagus structure: with 2 oval impressions near apical margin ventrally (Fig. 3: 3).

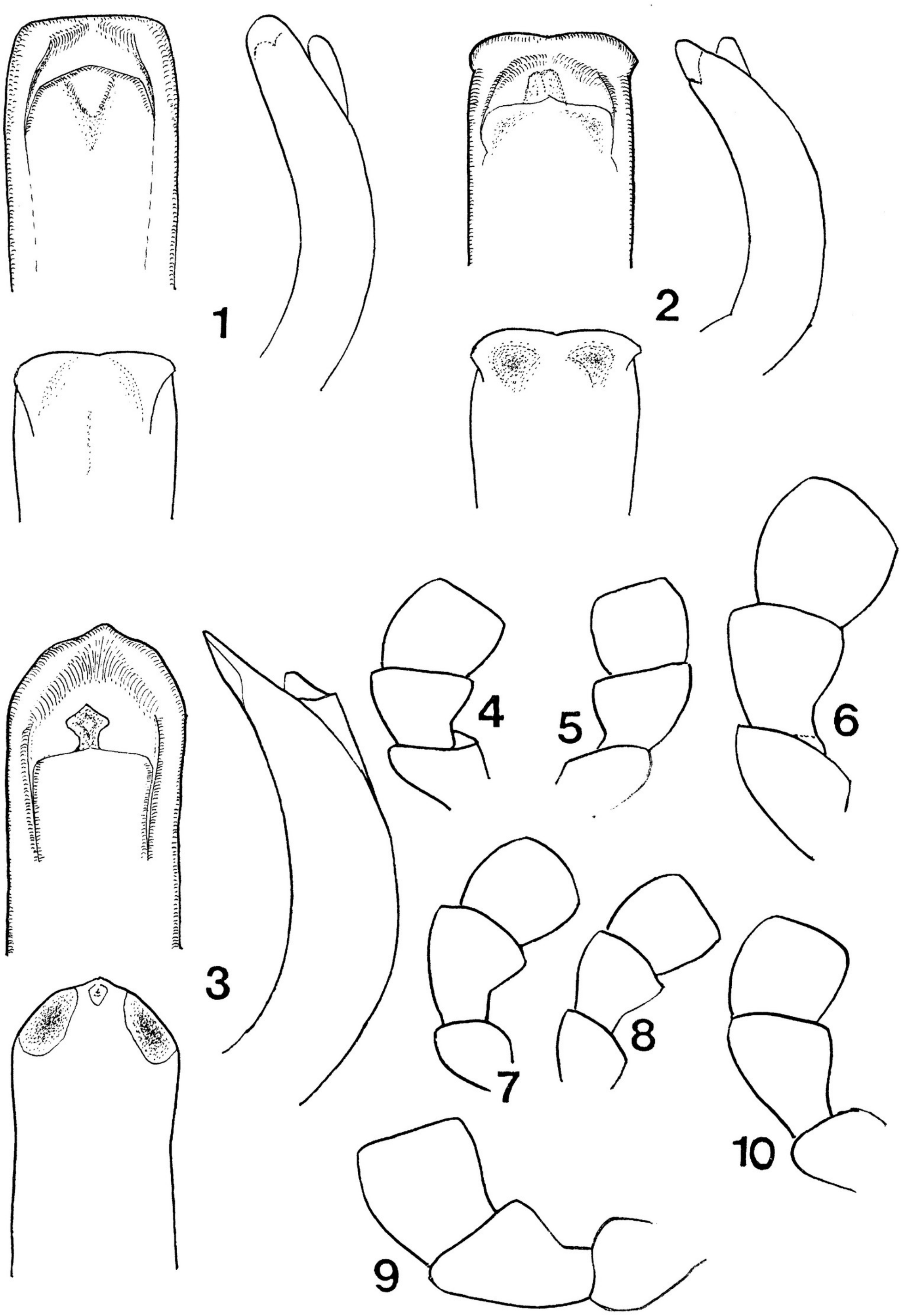


***Chrysocrosita* figure 1:** 1 – *Chrysolina alaschanica*, male (China: Alashan Mts.), dorsal view; 2–8 – maxillary palpus: 2 – *Ch. alaschanica*, male, 3–4 – *Ch. sulcicollis sulcicollis* (*Chrysomela teichophila*, syntypes, China: Khalgan) (3 – male, 4 – female), 5–6 – *Ch. spectabilis* (Tuva) (5 – male, 6 – female), 7–8 – *Ch. concinna* (7 – male, Tuva, 8 – female Mongolia: Ubsu Nuur aimak); 9–11 – prosternum: 9 – *Ch. alaschanica*, male (China: Alashan ridge), 10 – *Ch. nikolskyi,* female (Sakhalin Isl.), 11 – *Ch. sulcicollis*, male (China: Khingan); 12 – *Ch. nikolskyi adzhalamica* (holotype *Ch. sulcicollis adzhalamica*, Khabarovsk Krai: Sovetskaya Gavan), aedeagus, dorsal and lateral view. (Orig.)



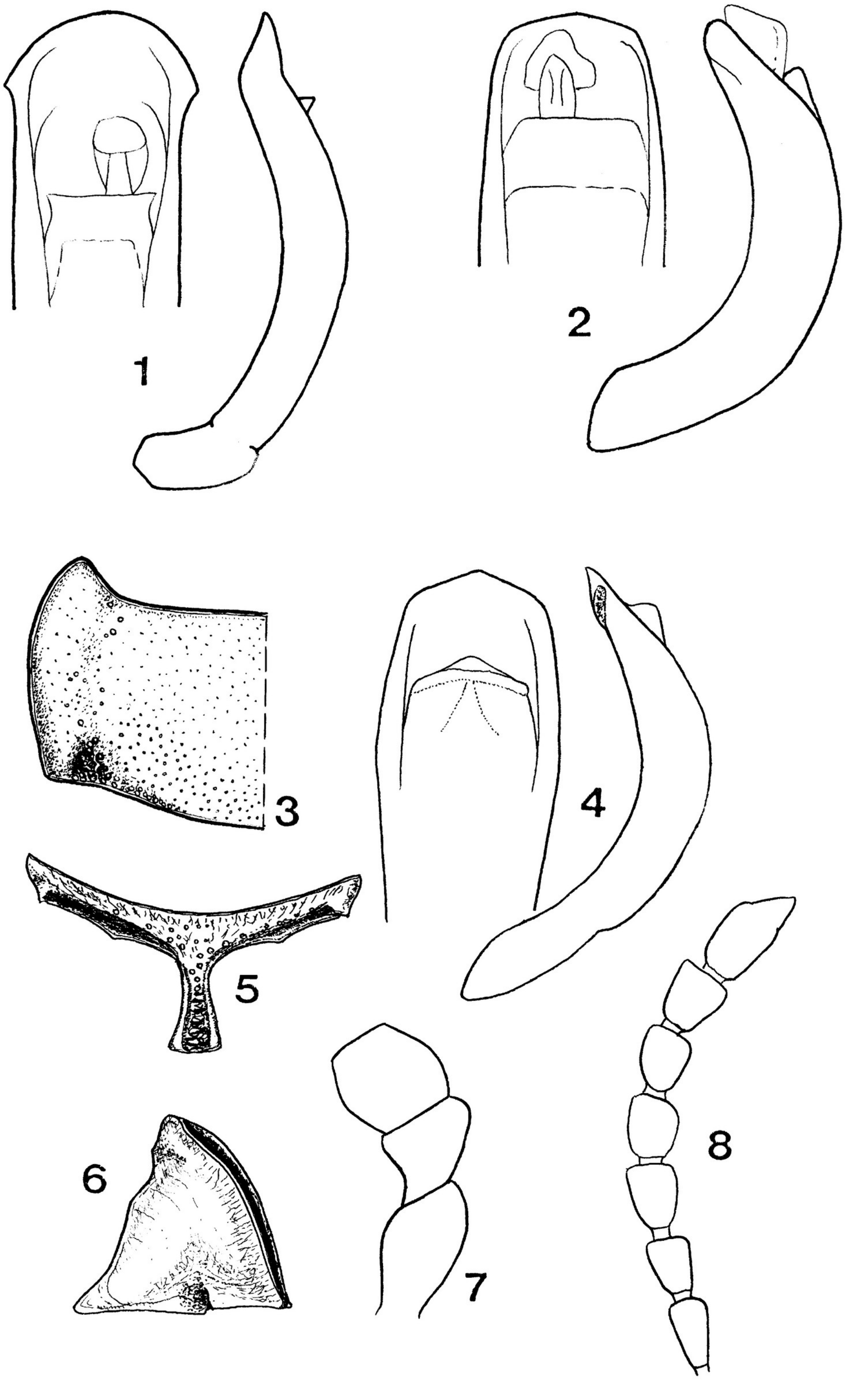
***Chrysocrosita* figure 2:** Aedeagus: 1 – *Chrysolina sulcicollis sulcicollis* (*Chrysomela teichophila*, syntype, China: Khalgan), 2 – *Ch. sulcicollis przewalskyana* (lectotype, China: Inner Mongolia), 3 – *Ch. sogdiorum* (Kyrghyzstan), 4 – *Ch. alaschanica* (China: Alashan Mts.), 5 – *Ch. spectabilis*

(Tuva), 6 – *Ch. nikolskyi nikolskyi* (Sakhalin Isl.). 1, 2, 4 – dorsal and lateral view, 3, 5, 6 – dorsal, ventral, and lateral view. (Orig.)



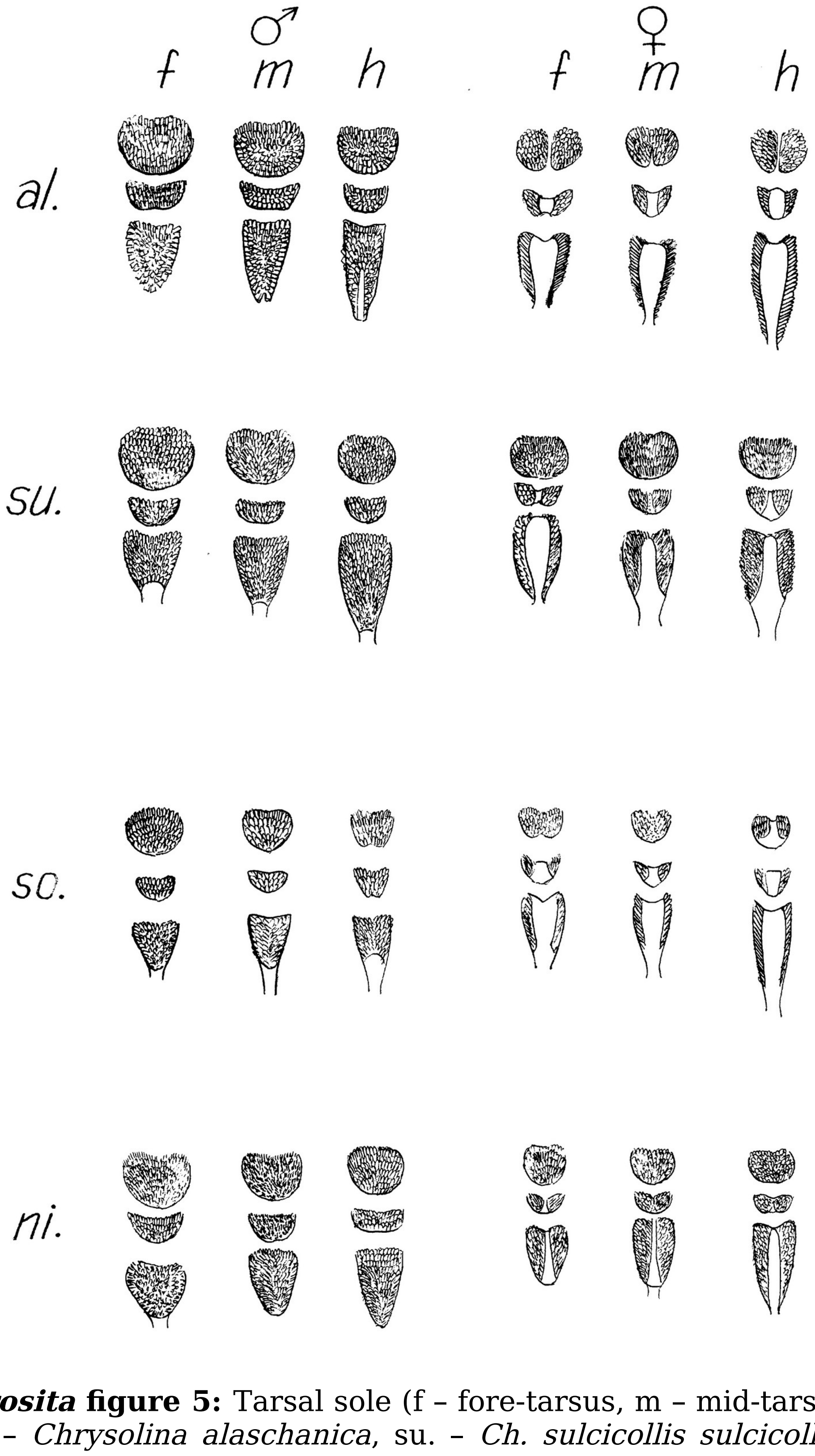
***Chrysocrosita* figure 3:** 1–3 – aedeagus, dorsal, ventral, and lateral view: 1 – *Chrysolina jakowlewi* (W Sayans), 2 – *Ch. concinna* (Tuva), 3 – *Ch. sulcicollis solida* (N Korea); 4–10 – maxillary palpus: 4 – *Ch. jakowlewi,* male (Siberia, Yenisei river valley), 5 – *Ch. jakowlewi,* female (W Sayans), 6 – *Ch. alaschanica,* female (China: Alashan Mts.), 7 – *Ch. sogdiorum,* male (Kyrghyzstan), 8 – *Ch. sogdiorum,* female (Kyrghyzstan), 9 – *Ch. nikolskyi*

nikolskyi, male (Sakhalin Isl.), 10 – *Ch. nikolskyi nikolskyi*, female (Sakhalin Isl.). (Orig.)

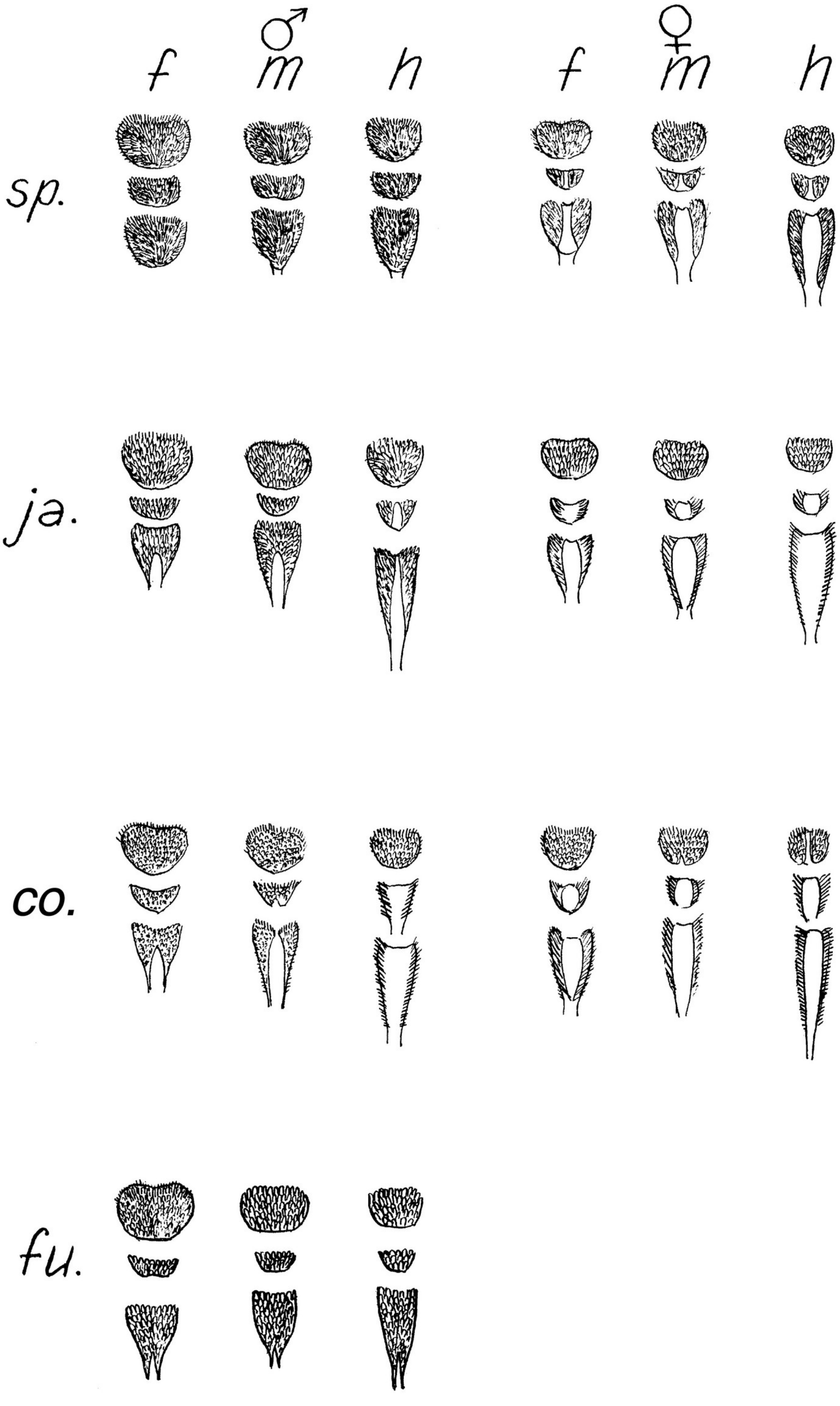


***Chrysocrosita* figure 4:** 1–2 – *Chrysolina nikolskyi sutschanica*, males (Primorsky Krai: S Sikhote Alin, Oblachnaya Mt.), aedeagus, intrapopulation variability; 3–8 – *Ch. fuyunica fuyunica*, male, syntype (China: Xinjiang Uygur

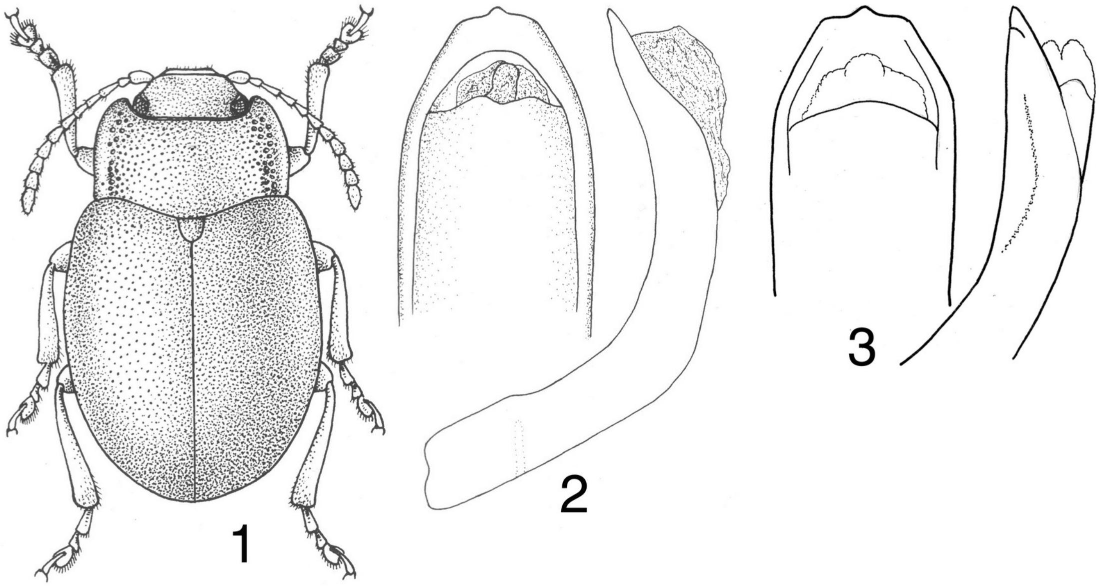
Autonomous Region): 3 – pronotum, 4 – aedeagus, 5 – prosternum, 6 – prothoracic hypomeron, 7 – maxillary palpus, 8 – antennomeres 5–11. (Orig.)



***Chrysocrosita* figure 5:** Tarsal sole (f – fore-tarsus, m – mid-tarsus, h – hind-tarsus, al.– *Chrysolina alaschanica*, su. – *Ch. sulcicollis sulcicollis*, so. – *Ch. sogdiorum*, ni. – *Ch. nikolskyi nikolskyi*). (Orig.)



***Chrysocrosita* figure 6:** Tarsal sole (f – fore-tarsus, m – mid-tarsus, h – hind-tarsus, sp. – *Chrysolina spectabilis,* ja. – *Ch. jakowlewi,* co. – *Ch. concinna,* fu. – *Ch. fuyunica fuyunica.* (Orig.)



***Chrysocrosita* figure 7:** *Chrysolina josefi* (China: Henan), male: 1, 2 – holotype: 1 – total dorsal view, 2 – aedeagus, dorsal and lateral view; 3 – paratype, aedeagus, dorsal and lateral view. (After: Ge, Daccordi, Yang, 2009: 1, 2; fig. 3 – orig.)